Burnout as a risk factor for antidepressant treatment — a repeated measures time-to-event analysis of 2936 Danish human service workers

Ida E.H. Madsen [a, *], Theis Lange [b], Marianne Borritz [c], Reiner Rugulies [a, d, e]

[a] National Research Centre for the Working Environment, Lerso Parkalle 105, DK-2100 Copenhagen, Denmark
[b] Department of Biostatistics, Copenhagen University, Oster Farimagsgade 5, DK-1014 Copenhagen, Denmark
[c] Occupational Medicine Department, Koge Hospital, Lykkebaekvej 1, DK-4600 Koge, Denmark
[d] Department of Public Health, University of Copenhagen, Oster Farimagsgade 5, DK-1014 Copenhagen, Denmark
[e] Department of Psychology, University of Copenhagen, Oster Farimagsgade 2A, DK-1353, Copenhagen, Denmark

ARTICLE INFO

ABSTRACT

Burnout is a state of emotional exhaustion, feelings of reduced personal accomplishment, and withdrawal from work thought to occur as a consequence of prolonged occupational stress. The condition is not included in the diagnostic classifications, but is considered likely to develop into depressive disorder in some cases. We examined the prospective association between burnout and antidepressant treatment, as an indicator of clinically significant mental disorder. We further investigated potential effect-modifiers of the association, to identify factors that may prevent this progression of burnout. We used questionnaire data from a three-wave study of Danish human service workers conducted during 1999—2005, linked with national register data on purchases of antidepressants (ATC: N06A). We included 4788 observations from 2936 individuals (81% women) and analysed data by Aalens additive hazards modeling, examining the risk of entering antidepressant treatment in relation to the level of work-related burnout measured by the Copenhagen Burnout inventory. As effect-modifiers we examined both sociodemographic factors and a range of psychosocial work environment factors. The level of burnout predicted antidepressant treatment. This association was modified by sex (p < 0.01). In men, high vs. intermediate burnout was associated with a 5% increased risk of antidepressant treatment per year of follow-up. This risk difference was 1% for women. Due to the sex specific patterns, we restricted effect modification analyses to women. We found no effect-modification by the examined work environment factors, though a sensitivity analysis indicated a possible stronger association in women of lower occupational position. In conclusion, burnout predicted antidepressant treatment, with a stronger association in men than women. We found no evidence of effect-modification by any of the examined psychosocial work environment factors.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Burnout is a state of emotional exhaustion, feelings of reduced personal accomplishment, and withdrawal from work thought to occur as a consequence of prolonged occupational stress (Maslach et al., 2001; Borritz, 2006). The symptoms are confined to the work domain and burnout is not an established clinical diagnosis. However, it is considered likely that burnout may progress into a clinically significant mental health problem, such as depression (Iacovides et al., 2003; Ahola and Hakanen, 2007, 2014). Most studies linking burnout and clinically significant mental health problems have been conducted cross-sectionally (Ahola and Hakanen, 2014). Prospective studies on the relation do exist, but they have primarily measured mental (ill) health using continuous measures of symptomatology without a clear indication of the clinical significance of the symptoms (Ahola and Hakanen, 2014; Hakanen and Schaufeli, 2012). This article examines whether burnout predicts antidepressant treatment, used as an objective indicator of clinically significant mental health problems.

The analyses are based on data from the PUMA study — a Danish study of human service workers conducted during 1999—2005, to examine the causes and consequences of burnout. For the purposes of the PUMA study, three different types of burnout were defined and measured by the Copenhagen Burnout Inventory (CBI)

* Corresponding author. Tel.: +45 39 16 52 94; fax: +45 39 16 52 01.
  E-mail address: ihm@nrcwe.dk (I.E.H. Madsen).

(Kristensen et al., 2005b): 1) personal burnout, 2) work-related burnout, and 3) client-related burnout. This article focuses on work-related burnout, that is *"... the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work"* (Kristensen et al., 2005b). In contrast to other burnout measures, such as the Maslach Burnout Inventory (Maslach and Jackson, 1981), the CBI focuses exclusively on the dimension of exhaustion, as the core characteristic of burnout. For an in depth discussion of the CBI and its validity see Kristensen et al. (2005b) and Schaufeli and Taris (2005).

Burnout is thought to develop as a consequence of prolonged occupational stress (Maslach et al., 2001; Borritz, 2006) and it is possible that working conditions may affect whether the state of burnout progresses into a clinically significant condition such as depression. In this article we explore whether the psychosocial working conditions emotional demands, influence, leadership quality, role clarity and role conflict, may hold such modifying properties. These factors could be effect modifiers as they are important work-related predictors of mental health or sickness absence (Söderfeldt et al., 1996; Westerlund et al., 2010; Grynderup et al., 2013; Johannessen et al., 2013; Rugulies et al., 2010a; Aagestad et al., 2014). Given these associations it is possible that burnout may be more likely to develop into a clinically significant mental health problem in the context of these adverse psychosocial conditions at work. Furthermore we examined sex, age, cohabitation and occupational position as potential effect-modifiers, as they are important non-work-related risk factors for mental health problems (Alonso et al., 2004; Simon, 2002; Rugulies et al., 2010b). We examined if these factors affected the risk of burnout progressing into a clinically significant mental health problem, by exploring whether the joint effects of burnout and these potential effect-modifiers on antidepressant treatment were more than additive. We chose this definition of effect-modification because it identifies groups who would benefit most from intervention and thus is particularly relevant from the clinical and public health perspectives (Greenland et al., 2008; Vandenbroucke et al., 2007; Greenland, 2009; Knol and VanderWeele, 2012; Rod et al., 2012).

2. Material and methods

2.1. Data

The study was a secondary data analysis using data from the Project on Burnout, Motivation and Job Satisfaction (PUMA), merged with the Danish national prescription registry (Kildemoes et al., 2011). PUMA was a three wave open cohort study designed to examine burnout in human service workers. Participants in the PUMA study were recruited from seven human service organizations: 1) 10 social security offices in an urban area; 2) a state psychiatric prison; 3) 16 county institutions for severely disabled people; 4) three somatic wards (surgical, medical, gynecological-obstetric) from two county hospitals; 5) one psychiatric ward from a psychiatric hospital; 6) one homecare service in a rural area; and 7) one homecare service in an urban area. Data were collected in 1999–2000 (wave 1), 2002–2003 (wave 2) and 2005 (wave 3). The response-rates for PUMA ranged between 75 and 88% (Madsen, 2012). Details on the PUMA study are published elsewhere (Borritz et al., 2006).

2.2. Measurement of antidepressant treatment

Antidepressant treatment was measured through the Danish national prescription registry, a national register containing data on all purchases of prescription medications at Danish

pharmacies since 1995 (Kildemoes et al., 2011). We linked data using the unique personal identification number (CPR-number) assigned to all Danish residents at birth or immigration (Pedersen, 2011). We included medication data from February 3rd 1998 (one year before the first response to the first wave of PUMA) until December 31st 2008 – three years after baseline of the final study wave. Antidepressant treatment was defined as all medications coded N06A according to the Anatomical Therapeutic Chemical classification system developed by the World Health Organization (2009).

2.3. Measurement of burnout

We measured burnout using the seven item scale on work-related burnout from the CBI that was developed in the PUMA study (Kristensen et al., 2005b). This scale focuses on the respondents' level of exhaustion that they attribute to work, and the items are: 1) *Do you feel worn out at the end of the working day?*, 2) *Are you exhausted in the morning at the thought of another day at work?*, 3) *Do you feel that every working hour is tiring for you?*, 4) *Do you have enough energy for family and friends during leisure time?* (inversely scored), 5) *Is your work emotionally exhausting?*, 6) *Does your work frustrate you?*, 7) *Do you feel burnt out because of your work?* There were five response options to each item ranging from "Always" to "Never/hardly ever" or from "To a very large extent" to "To a very small extent". Each item was scored equally spaced from 0 to 100 with higher scores indicating more severe levels of burnout, and the burnout score was calculated as the mean of the seven items. If the respondent had provided data on less than half of the items, the scale value was considered missing.

We categorised burnout into low (≤ 25), intermediate ($25 < score \leq 50$) and high (>50) to allow for non-linearity of the examined associations. The chosen ranges for the categories were based on considerations of both the distribution of the respondents and to obtain relatively comparable categorical ranges. We used the category of intermediate burnout level as the reference group because of the respondent distribution in relation to the combination of burnout and some of the examined work environment factors. For emotional demands, for instance, only few respondents had high emotional demands and low burnout. Consequently, applying the intermediate level of burnout as the reference yielded more stable estimates.

2.4. Measurement of potential effect-modifiers and covariates

The psychosocial work environment factors were measured by multidimensional scales using the validated Copenhagen Psychosocial Questionnaire (COPSOQ) (Kristensen et al., 2005a). For the present analysis we included the scales on emotional demands (three items, e.g. "*Is your work emotionally demanding?*", Chronbach's α (α) = 0.83), influence (six items, e.g. "*Can you influence the amount of work assigned to you?*", α = 0.74), quality of leadership (four items, e.g., "*To what extent would you say that your immediate superior is good at work planning?*", α = 0.90), role clarity (three items, e.g. "*Do you know exactly which areas are your responsibility?*", α = 0.82), role conflict (four items, e.g. "*Do you sometimes have to do things, which ought to have been done in a different way?* α = 0.73). All items had five response categories ranging from "Always" to "Never/hardly ever" or from "To a very large extent" to "To a very small extent". Each item was scored equally spaced from 0 to 100 and the scale value calculated as the mean item score, if the respondent had responded to half or more items. The scale values were then categorized into low (≤ 33),