



Adverse conditions at the workplace are associated with increased suicide risk



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ABSTRACT

Objective: The present study addressed potential harms of a negative working environment for employed subjects. The main aim was to evaluate if adverse working conditions and job strain are related to an increase in suicide mortality.

Methods: The study population consisted of 6817 participants drawn from the MONICA/KORA Augsburg, Germany, surveys conducted in 1984–1995, being employed at baseline examination and followed up on average for 12.6 years. Adverse working conditions were assessed by an instrument of 16 items about chronobiological, physical and psychosocial conditions at the workplace, job strain was assessed as defined by Karasek. Suicide risks were estimated by Cox regression adjusted for suicide-related risk factors.

Results: A number of 28 suicide cases were observed within follow-up. High levels of adversity in chronobiological/physical working conditions significantly increased the risk for suicide mortality (HR 3.28, 95% CI 1.43–7.54) compared to low/intermediate levels in a model adjusted for age, sex and survey (p value 0.005). Additional adjustment for living alone, low educational level, smoking, high alcohol consumption, obesity and depressed mood attenuated this effect (HR 2.73) but significance remained (p value 0.022). Adverse psychosocial working conditions and job strain, in contrast, had no impact on subsequent suicide mortality risk (p values > 0.200).

Conclusions: A negative working environment concerning chronobiological or physical conditions at the workplace had an unfavourable impact on suicide mortality risk, even after controlling for relevant suicide-related risk factors. Employer interventions aimed to improve workplace conditions might be considered as a suitable means to prevent suicides among employees.

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Since the outbreak of the current economic crisis in Europe, an increase of suicidal events were observed especially in countries which were particularly struck by the crisis (Stuckler et al., 2011; Economou et al., 2011; Chang et al., 2013). This phenomenon gained large public attention and was described by some media as “suicide by economic crisis” (New York Times, 2012). Moreover, suicide clusters were noticed in various companies across Europe which has raised the question about the potential harm of adverse

working conditions. In a French company, for instance, after the third suicide occurred at one of the company’s plants within four months “a prosecutor has opened an inquiry into working conditions” (The Guardian, 2007).

For preventive measurements, investigations about the relationship between negative working conditions and suicide mortality are crucial and need to consider suicide-related risk factors as well. Suicide mortality is elevated especially in individuals suffering from affective disorders or schizophrenia (Harris and Barraclough, 1997; Osby et al., 2001; Arseneault-Lapierre et al., 2004). Additionally, epidemiological studies revealed male sex, living alone, low educational level, smoking, high alcohol consumption and lower BMI as main risk factors for suicide mortality in the general population (Qin et al., 2003; Magnusson et al., 2006; Mukamal et al.,

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2010; Schneider et al., 2011; Li et al., 2012; Lukaschek et al., 2012; Schneider et al., 2014). High suicide risks were also observed in case of unemployment, especially during financial crises (Barr et al., 2012). It is well documented that adverse working conditions and work stress in particular are strongly related to indicators of depression (Bonde, 2008; Wieclaw et al., 2008; Netterstrom et al., 2008; Wang et al., 2012). This could be due to a mechanism linking working conditions with severe outcomes such as suicide. In the working population, however, evidence on a possible association between working conditions and suicide risk is sparse and inconclusive so far. Three studies using occupational- or population-based samples assessed the impact of job strain on suicide mortality and reported inconsistent findings (Feskanich et al., 2002; Tsutsumi et al., 2007; Ostry et al., 2007). Feskanich et al. revealed a rather U shaped relationship between work-related stress and suicide mortality (Feskanich et al., 2002). Ostry et al. found an increased suicide risk in case of low psychological job demands but not for low job control (Ostry et al., 2007). In contrast, Tsutsumi et al., estimated higher suicide risks for subjects with high job control but not for low job demand (Tsutsumi et al., 2007).

Compared with job strain, relationships between specific working conditions and suicide have been even more seldom studied. Strain can be induced by a variety of adverse conditions in the workplace mainly consisting of chronobiological (e.g. overtime, night or shift work), physical (e.g. noise or pollutants) or psychosocial (e.g. demand-control, strong competition) components (Woo and Postolache, 2008). An autopsy study from Japan, for instance, identified long working hours as a common condition for the majority of the 22 investigated suicide cases (Amagasa et al., 2005). Overall, the evidence for an impact of high job strain and adverse working conditions on the risk of suicide mortality remains poor, especially in a population-based, prospective context. Therefore, the present study was carried out to evaluate associations between adverse working conditions and job strain on suicide mortality risk in a representative working population in a region located in Southern Germany using a prospective study design.

1. Materials and methods

1.1. Study design

The data of the present study was drawn from three population-based MONICA/KORA Augsburg surveys (S1, S2, S3) conducted between 1984 and 1995 in the region of Augsburg, southern Germany, and followed-up within the KORA research platform (Holle et al., 2005). The MONICA Augsburg project was part of the multinational WHO MONICA project aimed to estimate the prevalence and distribution of cardiovascular risk factors among men and women aged 25–64 (S1) or 25–74 years (S2, S3) (WHO MONICA Project Principal Investigators, 1988). All procedures were subjected to constant quality assessment. The study was approved by the local authorities and followed the declaration of Helsinki. Written informed consent was obtained from all participants.

1.2. Study population

Altogether, 13,427 participants (6725 men, 6702 women, response rate 77%) aged 25–74 years, randomly drawn from the general population, participated in one of three cross-sectional surveys. In a subsample of 12,888 subjects, a psychodiagnostic assessment was obtained through self-administered questionnaires that followed the WHO MONICA psychosocial optional study recommendations (WHO MONICA Project Principal Investigators, 1989). A total of 7466 subjects (57.9%) reported to be currently employed at the baseline examination representing the working

population of the underlying general population. After excluding 649 participants with missing information on either of the two exposures, 'job strain' and 'adverse working conditions' or on follow-up status, the study population of the present analyses consisted of 6817 employed subjects (4269 men and 2548 women) with a mean age of 42.2 years (standard deviation 10.4).

Some subjects were recruited for more than one survey by chance. In this case, only the risk factor assessment at the first survey was included in the present analysis.

1.3. Assessment of adverse working conditions and job strain

Information on working conditions and work-related stress were assessed at the baseline examination by the German version of a self-administered questionnaire following the recommendations of the MONICA psychosocial optional study (WHO MONICA Project Principal Investigators, 1989). This data set included a variety of work-related instruments, which were used to define the following three exposures:

- a) 'Adverse chronobiological/physical working conditions' were assessed by an instrument comprising 11 items which measured chronobiological (overtime, shift work, night shifts, taskwork, assembly-line work) and physical (screen handling work, physically challenging work, dangerous work, noise, pollutants, radioactive radiation) working conditions. Summing up these 11 three-scaled single items (coded as 1 = 'never', 2 = 'sometimes', 3 = 'frequently') gave a score ranging from 11 to 28 in the present study population. The exposure 'adverse chronobiological/physical working conditions' was defined by classifying this score into a 'low/intermediate' and a 'high' group using the upper tertile as a cut-off point (<16 , ≥ 16).
- b) 'Adverse psychosocial working conditions' were assessed by an instrument comprising five items concerning psychological and social components (disturbances and interruptions, urge for fast decisions, high responsibility for people, high responsibility for machines, strong competition). Summing up these five three-scaled single items (coded as 1 = 'never', 2 = 'sometimes', 3 = 'frequently') gave a score ranging from 5 to 15 in the present study population. The exposure 'adverse psychosocial working conditions' was defined by classifying this score into a 'low/intermediate' and a 'high' group using the upper tertile as a cut-off point (<10 , ≥ 10).
- c) 'Job strain' was assessed by the well-characterised Job Content Questionnaire (JCO) which included five items concerning demands, four items concerning skills and two items concerning decision authority (Karasek et al., 1998). First, scores of job demand and job control were created by summing up the respective single four-scaled items. Then, the job strain score was calculated by dividing the job demand score by the job control score leading to a continuous variable ranging from 0.21 to 2.83 in the present study population. The exposure 'job strain' was then defined by classifying the score into groups of 'low/intermediate' and 'high' job strain using the upper tertile as a cut-off point (<0.778 , ≥ 0.778).

The upper tertiles of the score distributions were chosen a priori (before the analyses) as cut-off points. This choice was driven by the assumption that essentially high levels of adverse working conditions or job strain might have an impact on suicide mortality in contrast to low or intermediate levels. Analyses using three categories (upper versus intermediate versus low third) could not be performed with sufficient validity due to the low number of suicide cases especially in the lower third of the chronobiological/physical working conditions score.

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