



## Research paper

# The longitudinal relationship between control over working hours and depressive symptoms: Results from SLOSH, a population-based cohort study



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## ABSTRACT

**Background:** Psychosocial work factors can affect depressive moods, but research is inconclusive if flexibility to self-determine working hours (work-time control, WTC) is associated with depressive symptoms over time. We investigated if either sub-dimension of WTC, control over daily hours and control over time off, was related to depressive symptoms over time and examined causal, reversed-causal, and reciprocal pathways.

**Methods:** The study was based on four waves of the Swedish Longitudinal Occupational Survey of Health which is a follow-up of representative samples of the Swedish working population. WTC was measured using a 5-item index. Depressive symptoms were assessed with a brief subscale of the Symptom Checklist. Latent growth curve models and cross-lagged panel models were tested.

**Results:** Best fit was found for a model with correlated intercepts (control over daily hours) and both correlated intercepts and slopes (control over time off) between WTC and depressive symptoms, with stronger associations for control over time off. Causal models estimating impacts from WTC to subsequent depressive symptoms were best fitting, with a standardised coefficient between  $-0.023$  and  $-0.048$ .

**Limitations:** Results were mainly based on self-report data and mean age in the study sample was relatively high.

**Conclusion:** Higher WTC was related to fewer depressive symptoms over time albeit small effects. Giving workers control over working hours – especially over taking breaks and vacation – may improve working conditions and buffer against developing depression, potentially by enabling workers to recover more easily and promoting work-life balance.

## 1. Introduction

Psychological conditions have become the most common reason for sickness absence accounting for 47% in women and 35% in men receiving sickness benefits in Sweden (Försäkringskassan, 2015) – with affective disorders like depressive, anxiety and stress-related disorders taking the lion's share (Försäkringskassan, 2014). Depression not only affects labour capacity, but can also be the outcome of work environment factors such as social support, organisational justice, job control and psychological demands (Bonde, 2008; Magnusson Hanson et al., 2014b). Results from a meta-analysis found moderately strong evidence for decision latitude (a dimension of job control), job strain (high psychological demands paired with low control), and bullying at work

affecting depressive symptoms over time (Theorell et al., 2015). Preventing adverse work environments and work-related psychosocial stressors has received more attention as economic costs of mental health disorders make risk factors for depression at work a major public health concern (Berto et al., 2000).

One aspect of working conditions that is understudied but potentially affects mental health and depression is control over working hours, or work-time control (WTC; Härmä, 2014). Some studies observed that high levels of WTC protect against mental health complaints like depressive symptoms while low WTC is associated with poor health (Ala-Mursula et al., 2005; Takahashi et al., 2012). But a systematic review concluded that the evidence of WTC affecting any health outcome is insufficient – at least partly because longitudinal

**Abbreviations:** WTC, work-time control; SLOSH, Swedish Longitudinal Occupational Survey of Health; SWES, Swedish Work Environment Survey; LGCM, Latent growth curve modelling; SEM, Structural equation modelling; RMSEA, root mean square error of approximation; CFI, comparative fit index; SRMR, standardised root mean squared residual; AIC, Akaike information criterion; BIC, Bayesian information criterion

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studies are lacking (Nijp et al., 2012).

We define WTC as the autonomy over duration and timing of work (Knauth, 1998) with two sub-dimensions regarding *control over daily hours* (self-determining starting and ending times of work and length of a workday) and *control over time off* (scheduling vacation, taking breaks and running private errands during work; Albrecht et al., 2016). Some studies observed that high levels of WTC are related to lower levels of depressive symptoms, fatigue and sleep disturbances (Ala-Mursula, 2005; Salo et al., 2002, 2014). Using a one-year follow-up design Takahashi et al. (2012), observed that stable high or increasing levels of WTC were related to fewer depressive symptoms, longer sleep duration and less fatigue after one year compared to baseline.

But several studies found no relation between WTC and depression/mental health (for a systematic review refer to Nijp et al., 2012). In contrast to Ala-Mursula et al. (2002), Jang et al. (2011), failed to find an effect of low WTC on psychological distress. In another study, low levels of WTC were unrelated to stress and burnout symptoms in physicians (Tucker et al., 2015). Moreover, the differential effects that both sub-dimensions of WTC – control over daily hours and control over time off – could have on depression are rarely assessed (Nijp et al., 2012).

There are at least two hypothesised mechanisms through which WTC potentially affects mental health. The *effort-recovery model* provides an explanation for the influence of work stressors on workers' well-being (Meijman and Mulder, 1998). Effort at work results in productivity gains but also costs in physio- and psychological outcomes. Workers need to recover from these expenditures during work breaks or after work. If time for recovery is insufficient, workers expend more effort which in turn builds up need for recovery. As high WTC allows to self-determine working hours to fit personal schedules, flexible recovery opportunities should increase and buffer against negative health outcomes associated with exhaustion and fatigue such as depression (Geurts and Sonnentag, 2006).

Another hypothesis why higher levels of WTC should benefit health outcomes is that increased WTC enables workers to better align their working hours with demands stemming from outside of work. As such, WTC should improve work-life balance which in turn relates to favourable outcomes in workers' health, energy, and satisfaction (Geurts and Demerouti, 2003; Leineweber et al., 2012). Likewise, WTC should benefit the psychosocial work environment and affect job and social climate, work demands, job satisfaction, and morale of workers (Joyce et al., 2010).

Research is inconclusive if either of the sub-dimensions of WTC impacts mental health differently than the other one (Nijp et al., 2012). Either control over time off affects mental health more pronouncedly as it increases opportunities to recover – short- and long-term (Geurts and Sonnentag, 2006). Or control over daily hours is more effective as it allows to align daily working hours to acute needs and consistently promotes a psychological sense of control (Geurts and Demerouti, 2003).

Although these proposed mechanisms can account for positive effects of WTC on depression, there are equally strong arguments for reversed causation (Hobfoll 1989). predicts in his Conservation of Resources (COR) model that 'loss spirals' follow initial depletion of resources. As individuals strive to maintain resources – which can be anything from material goods to personal, energy resources – losses are of greater salience than gains. With each incidence of resource loss, individuals are less equipped and less resourceful to face new situations that could mean depletion. At the same time, resources are connected to each other, meaning loss in one resource can result in losses in another, which results in a downward spiral. As such, resource loss is the main reason for stress (Hobfoll, 2001). Translated to the situation at work this means that healthy workers are more likely to perceive and develop resources at work such as WTC. Conversely, mental health complaints mean a loss in resource and would promote a less favourable perception of the work environment. Additionally, research

on information processing showed that depressive individuals perceive their environment in a more negative way (Beck, 2002). These results support the notion that depressive symptoms could also adversely impact perceived WTC.

If mental health complaints partly account for lower ratings of WTC, studies systematically overestimate the impact of WTC on health (Takahashi et al., 2012). This could explain some of the inconsistencies in results. A number of studies report reciprocal effects between psychosocial working conditions and mental health, for instance between job strain (including low job control which conceptually relates to WTC) and depression/distress (Ibrahim et al., 2009) and job demands and psychological distress (Dalgard et al., 2009). These results indicate that depressive symptoms likely affect ratings of job characteristics, and that reversed-causal as well as reciprocal pathways need to be investigated in this context.

### 1.1. Aim

Due to a lack in longitudinal studies and inconsistencies in measurement, the strength and direction of the association between WTC and mental health remains unclear (Albrecht et al., 2016; Nijp et al., 2012). Differential effects of either sub-dimension – control over daily hours and control over time off – have rarely been investigated. The present study used Structural Equation Modelling (SEM) to assess the association of levels and change in WTC and depressive symptoms over a time span of six years in a large, four-wave sample of Swedish workers. Based on evidence and theoretical mechanisms, we examined four hypotheses: (1) WTC is related to depressive symptoms over time, (2) WTC affects depressive symptoms, (3) depressive symptoms affect perceived WTC, and (4) WTC and depressive symptoms reciprocally affect each other. Each hypothesis was considered separately for control over daily hours and control over time off to explore any differential effects.

## 2. Methods

### 2.1. Study design and population

Data were obtained from the Swedish Longitudinal Occupational Survey of Health (SLOSH) which is an approximately representative sample of the Swedish working population aged between 16 and 64 years. In SLOSH, respondents of the Swedish Work Environment Survey (SWES; 2003–2011) were followed-up via self-administered questionnaires (with separate ones for those in and outside paid work) every other year since 2006. Gender as well as labour market sector distributions are approximately representative of the population. The current study was based on four SLOSH waves with response rates of 61.1%, (n=11441) in 2008 (Time 1), 56.4% (n=11525) in 2010 (Time 2), 56.8% (n=9880) in 2012 (Time 3), and 52.6% (n=20316) in 2014 (Time 4). Participants were included if they answered the questionnaire for those in paid work in at least two out of four waves and were not self-employed (i.e. entrepreneurs or farmers). Valid sample size was n=2791. Ethical approval for SLOSH and the present study was obtained from the Regional Research Ethics Board in Stockholm.

### 2.2. Measures

#### 2.2.1. Work time control

WTC was measured using an adapted 5-item scale based on Ala-Mursula et al. (2005) which assessed the perceived control over length of working time, starting and ending times of work, taking breaks during work, running private errands at work, and scheduling vacation and other leave. Perceived influence was rated on a 5-point Likert scale from 1 (very little) to 5 (very much). The items cover two sub-dimensions of WTC: Control over daily work (two items: length of working time, starting and ending times of work) and control over time

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