Employee control over working times: associations with subjective health and sickness absences

L Ala-Mursula, J Vahtera, M Kivimäki, M V Kevin, J Pentti

Study objective: To investigate the impact of employees’ worktime control on health, taking into account other aspects of job control.


Setting: Eight towns in Finland.

Participants: 6442 municipal employees (1490 men and 4952 women) representing the staff of the towns studied. Follow up was 17 706 person years.

Main results: In women, poor health and psychological distress were more prevalent among those in the lowest quartile of worktime control than those in the highest (after adjustment for potential confounders including other aspects of job control, odds ratios and their 95% confidence intervals for poor health and psychological distress were 1.8 [1.5 to 2.3] and 1.6 [1.3 to 2.0], respectively. Correspondingly, the adjusted sickness absence rate was 1.2 [1.1 to 1.2] times higher in women with low worktime control than in women with high worktime control. In men, no significant associations between worktime control and health were found. These results, obtained from the total sample, were replicable within a homogeneous occupational group comprising women and men.

Conclusions: Exploration of specific aspects of job control provides new information about potentially reversible causes of health problems in a working population. Worktime control is an independent predictor of health in women but not in men. Dissimilarities in the distribution of occupations between men and women are not a probable explanation for this difference.
medically certified sick leave per 100 person years in 1997–98 were 68.9 in men and 87.3 in women. The sample represented the eligible population well. In terms of age, practically no differences were evident. The proportion of women and the rate of medically certified sickness absence were somewhat higher in the sample than in the eligible population.

The study was approved by the ethics committee of the Finnish Institute of Occupational Health.

**Worktime control**

Worktime control was measured on a six item scale, modified from a standard survey instrument of Statistics Finland. The respondents were asked to rate how much they were able to influence the following aspects of their working times:

1. The starting and ending times of a workday
2. The taking of breaks during the workday
3. Handling private matters during the workday
4. The scheduling of workshifts
5. The scheduling of vacations and paid days off, and
6. The taking of unpaid leave.

The items cover most of the worktime control processes contained in the regulations concerning work contracts. Our scale also operationalises a key element of the different worktime models applied in modern working life—that is, autonomy with regard to worktime (worker control over the time models applied in modern working life—that is, scale also operationalises a key element of the different worktime models applied in modern working life—that is, autonomous control over worktime (worker control over the duration, position, and distribution of his/her individual worktime). Finally, the scale covers topics that are regarded as important in research into job control, but which have been neglected. These include (a) control over work scheduling, for example, working hours (item 1), vacations and days off (items 5 and 6) and choice of shifts (item 4), as well as (b) control over work pacing, for example, scheduling and duration of rest breaks (items 2 and 3).

Responses were given on a five point scale (1 = very little, ..., 5 = very much). We used the mean of the six items (Cronbach’s α = 0.82, mean 2.78 and SD 0.87).

**Health**

Self rated health was assessed by an overall rating of health on a five point scale (1 = good, 2 = fairly good, 3 = average, 4 = fairly poor, 5 = poor). This measure was dichotomised by grouping response scores 1–2 as a category of good health and scores 3–5 as a category of poor health. Self rated health is a widely used concept in medical, epidemiological, and health psychological research. It has been a powerful predictor of mortality and morbidity and has been shown to be associated with the number of physician contacts per year in a working population. In our sample 507 men (34.3%) and 1549 women (31.6%) had poor health.

Psychological distress was obtained from the 12 item version of Goldberg’s (1972) General Health Questionnaire (GHQ-12), which has been developed to serve as a screen for unspecific psychiatric morbidity in populations. In the 12 items respondents consider symptoms of psychiatric morbidity, for example, feelings of depression, loss of confidence or sleep disturbances. As in studies validating the GHQ-12 against standardised psychiatric interviews, we used the cut off point of experiencing at least four of the symptoms more than usual to indicate psychological distress. In this sample 345 (23.2%) men and 1242 (25.2%) women had psychological distress.

**Statistical analyses**

We used analyses of variance to study the associations between worktime control and other predictors of health. To study the relations between other predictors and health, regression analyses were applied. Logistic regression was used...
in relation to self rated health and psychological distress and Poisson regression models in relation to sickness absence. Poisson regression models were fitted to the data, as the number of sick leaves is a form of count data and as these models permit individual follow up times to be taken into account. Use of the Poisson model implies that the between-employee variance in the rates of sick leave is equal to the expected rate of sick leave. In this study, the dispersion in medically certified sick leaves did not significantly deviate from the assumptions for Poisson models.

We studied the associations of worktime control with self rated health and psychological distress by means of logistic regression and the associations with sickness absence by means of hierarchical Poisson regression models. Adjustments were made for demographics (age, educational level, marital status, and existence of dependent children), measures of health risk behaviour (smoking, alcohol consumption, body mass index, and sedentary life style), and baseline sickness absence. We then studied the associations with health of worktime control, job control and job demands both separately and in the same models, adjusted for demographics and health risk behaviour.

Worktime control, job control and job demands were divided into quartiles and treated as categorical variables. The results of regression analyses were expressed by odds ratios for logistic models and rate ratios for Poisson models, including their 95% confidence intervals. All analyses were performed separately for men and women. We used the SPSS statistical program and the GENMOD procedure of the SAS program package for the analyses.

### RESULTS

#### Worktime control and other predictors of health

There was no difference in the level of worktime control between men and women (mean ratings 2.77 (SD 0.89) and 2.80 (SD 0.85) for men and women, respectively). In both genders, worktime control was linearly associated with job control (table 1). In men, poor worktime control was associated with low education and high job demands. In women, poor worktime control was related to high education, the existence of dependent children and low job demands.

#### Associations between other predictors and health

Poor health was associated with old age, low education, smoking, obesity, and sedentariness in both genders, and with no dependent children in women (table 2). Psychological distress was associated with sedentariness in both genders. In addition, men with no dependent children and women of old age had an increased risk of sickness absence.
Worktime control and health

In women, level of worktime control was consistently associated with subjective health. Odds ratios for poor health and psychological distress were twice as high among those in the lowest quartile of worktime control than those in the highest quartile, after adjustment for age, educational level, family characteristics, and traditional health risk behaviour. The association between worktime control and forthcoming sickness absence remained significant in women even after the adjustment for prior sickness absence.

In both men and women, employees in the two lowest quartiles of worktime control had a 1.2 times higher rate of medically certified sickness absences than those in the highest quartile, after adjustment for age, educational level, family characteristics, and traditional health risk behaviour. The association between worktime control and forthcoming sickness absence remained significant in women even after the adjustment for prior sickness absence.

### Table 2  Associations of demographics and measures of health behaviour with poor health, psychological distress, and medically certified sickness absences adjusted for age

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*Odds ratio (95% confidence intervals); †rate ratio (95% confidence intervals).

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As shown in table 4, in women the strength of the association between worktime control and all indicators of health was similar in magnitude to that between job control and health. An effect of worktime control was still evident after adjustment for job control and job demands. In both men and women, there was an association between level of worktime control and sickness absence. However, after adjustment for other work characteristics the association was significant only in women.

To study whether the differences in the results between men and women were accounted for by the differences in distributions of occupations, we analysed the results adjusting for occupational status instead of educational level. Findings were similar in all cases.

### Subgroup analysis in teachers

As a final step, we analysed the association between worktime control and health within a single occupation, teachers, the largest occupational group of our sample comprising both men (n=297) and women (n=916). Compared with the highest quartile of worktime control, the odds ratios of the lowest quartile for poor health were 3.21 (1.54 to 6.69) among female teachers and 1.71 (0.62 to 4.72) among male teachers (adjusted for age, educational level, marital status, existence of dependents, smoking, alcohol consumption, body mass index, and sedentary life style). The corresponding figures for psychological distress were 2.45 (1.33 to 4.54) and 1.14 (0.44 to 2.92) in female and male teachers, respectively. Women in the lowest quartile of worktime control had a 1.23 (0.95 to 1.59) times higher rate of medically certified sickness absence than those in the highest quartile. The corresponding rate ratio was 0.93 (0.58 to 1.51) in men. Thus, the results within a single occupational group were well in line with those found in the total sample (table 3, model 3).

### DISCUSSION

We found that control over working times in women was associated with aspects of health such as self rated health status, psychological distress, and medically certified sickness absence.
absence. Furthermore, as poor worktime control predicted sickness absence even after controlling for baseline sick leaves and other dimensions of control, our results indicate that poor worktime control is an independent health risk in women.

Previous studies have suggested an increased risk of cardiovascular morbidity in occupations characterised by poor worktime control, in both men and women. However, in these studies potential confounding factors were not controlled for as extensively as in the study reported here.

**Worktime control as a control dimension**

Sargent and Terry have suggested a distinction between the task relevant and peripheral dimensions of control, the former having been the main focus in prior research. In this classification, worktime control appears as peripheral. Although in men the health effects of task-relevant aspects such as skill discretion and decision authority were stronger than those related to worktime control, our results for female employees support the importance of extending the research beyond the task relevant dimension of control at work.

**Possible explanations for the gender specific results**

Explanations for the differences between men and women in the health effects of worktime control may relate to at least two categories of factors: total workload and work characteristics.

Prior research suggests that the differences in workloads between genders are great at home but less obvious at work within the same occupational groups. Thus, in the case of similar loads at work between men and women, women face a larger total workload because of their major share of home responsibilities. Studies on top level managers, for example, showed that the levels of stress hormone excretions and blood pressure did not differ between men and women during the workday. However, in the evening these levels decreased in men but increased in women, reflecting the gender differences in unpaid work.

Control over working times contributes to employees’ opportunities to successfully manage the work/non-work interface and to integrate working life with private life. Thus, high worktime control could provide better opportunities to control not only the load of paid work but also the total workload. As housekeeping responsibilities concern women more than men, the important role of worktime control among aspects of control, especially in women, is to be expected.

It is also possible that the gender specific health effects of worktime control stem from differences in work characteristics between men and women. To examine this, we studied the largest two gender occupation in our sample, the teachers. Compared with the total sample, variation in work characteristics between men and women was low within this occupational group. Despite this, the gender specific results on worktime control and health were replicated, and in magnitudes similar to the total sample.

Findings on teachers suggest that differences in formal work characteristics do not explain the observed gender differences in the effects of worktime control on health. However, these findings do not rule out explanations related to differences in actual work characteristics or perceptions on work. We found differences in perceived work characteristics between men and women. Although high educational level is usually associated with high job control and position in the organisational hierarchy, results on control over worktime followed this pattern only in men. In fact, perceived worktime control was lowest in women with a university level education. Corresponding results have been derived from a study of the British Birth Cohort 1958 in which flexibility of break times produced a socioeconomic gradient in men, but not in women.

**Key points**

- Worktime control is associated with health in women.
- This association is independent of job control.
- Dissimilarities in the distribution of occupations are not a probable explanation for the gender difference.

**Methodological considerations**

We used three measures of ill health, two related to self reports of subjective experiences and one to archival data of functional disability. Reflecting a high robustness of the main findings, the results were replicable across all these measures both in the total sample and its subgroup of teachers. Self rated health and GHQ are well established health outcomes. Sickness absences also serve as a measure of health in the working population when health is understood as a mixture of social, psychological, and physiological functioning.

Recorded sickness absence data have several advantages: they cover information on the health problems during every working day of the total study period, and the quality of the data in terms of coverage, accuracy, and consistency over time is superior to that attainable via self reports.

It could be argued that controlling for health behaviour and other work characteristics is overadjusting, as these factors may reflect different aspects of a single process, and as adverse work characteristics tend to accumulate in particular individuals. Our findings in the fully adjusted models therefore represent conservative estimates of the independent effects of worktime control.

Comparison of the magnitudes of the effects shows that worktime control was more strongly associated with self reports of health than with register based absences. It is possible that common method variance is partially responsible for the higher effect size. One may ask whether the observed effect sizes are large enough to be significant in working life. We argue that this is the case because considerable costs can be expected as half of the nation when health is understood at median level worktime control had a 20% excess of medically certified sickness absence. Furthermore, worktime control represents a potentially reversible factor of ill health.

**CONCLUSION**

The modernisation of working times is a major issue in societies throughout Europe. The main trends can be characterised as differentiation and individualisation of working times, as the institutional frame has become flexible and local. Flexibility in working times is increasingly common. Although such flexibility has been introduced to meet many employers’ viewpoints, it may also provide opportunities for a better fit of private needs with occupational demands among employees.

Our findings suggest that a high level of control over working times buffers against health problems in women but not necessarily in men. Worktime control may help in integrating working and private lives. The greater significance of worktime control in female employees may relate to gender differences in roles at home rather than to gender related occupational segregation.

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Conflicts of interest: none.

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