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Abstract

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Keywords

factors, employees, australian, leave, sick, occupational

Disciplines

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Article Title: Occupational Factors and Sick Leave in Australian Employees

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ABSTRACT

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Methods: Longitudinal data (self-report) from 2861 Australian full-time employees (69.4% male) were used. Occupational factors and relevant covariates were assessed at baseline, with sick leave assessed yearly over a four-year period. The data were analysed using multinomial logistic regression models.

Results: Job strain and longer commuting time were associated with long sick leave, whereas long work hours were inversely associated with long sick leave.

Conclusions: These results provide further evidence that certain aspects of work are associated with sick leave, whereas other work aspects such as long work hours are inversely associated with sick leave. Organisations need to understand and address these factors to improve the well-being of employees and increase workplace productivity.

INTRODUCTION

Sick leave is an important economic issue in Australia and other developed countries given its negative impact on workplace productivity and substantial financial cost to employers and organizations.^{1,2} Sick leave is also considered an important indicator of an individual's underlying health, and extended periods of sick leave can negatively affect job security, financial status, and social relationships.³ It is therefore important to identify and understand the key determinants of sick leave to improve both employee health and workplace productivity.

Sick leave is complex and influenced by a variety of demographic/social factors (eg, social insurance, marital status, age, and sex), industry-related factors (ie, size, nature, and type of industry), and government policies.^{2,4} Beyond these factors, researchers have also examined how facets of an employee's psychosocial work environment impact on sick leave absences and general health.⁵ One of the most widely investigated constructs in this area is psychological job strain, conceptualized in Karasek's⁶ demand/control model as a combination of high psychological demands and low decision latitude (or control). A number of studies have demonstrated that high job strain contributes to a range of chronic health conditions including cardiovascular disease and depression.⁷⁻⁹ Moreover, a growing body of evidence suggests that job strain is associated with longer and more frequent periods of sick leave.^{1,2,5,9-15} Job strain may contribute to longer sick leave by impairing health, as it increases the risk of chronic health conditions such as hypertension and depression. It is also possible that individuals in high strain jobs

take more sick leave as a conscious coping strategy to reduce the impact of high strain and allow for recovery from work.^{4,16}

Job strain is, therefore, an important predictor of sick leave. However, other aspects of the work environment such as work hours, work schedules, and job security have also been associated with sick leave.¹⁷⁻¹⁹ A limitation of previous research in this area is that various features of the work environment have seldom been examined simultaneously; this is essential in identifying the work-related factors that are the most salient predictors of sick leave.^{11,17} Subsequently, there is a clear need for research that examines a comprehensive range of potential predictors of sick leave.

Furthermore, one work-related factor that has not been widely examined in this area is time spent commuting to and from work. This factor is relevant given that the nature of commuting to and from work has changed considerably in recent decades. In Australia, for example, there has been a trend toward increased distance and time spent commuting to and from work in the past decade.²⁰ In the United States, commuting time to and from work also increased between 1990 and 2000.²¹ Longer commuting to and from work has been associated with increased stress, which may contribute to sick leave.^{22,23} In the 1970s, Taylor and Pocock²⁴ demonstrated that increased commuting time (eg, >1.5 hours a day) is associated with sick leave; however, this relationship has not been examined comprehensively and more recent data are lacking.

Another gap in the literature is that it is not clear whether the nature of the association between work-related factors and sick leave varies across different

occupations. Many studies have examined single occupations,^{4,10,13,18} whereas others with more heterogeneous samples have rarely examined group differences.^{1,25} Only a few studies have attempted to compare differences in the nature of this relationship across different occupation types.^{26,27} Consequently, further investigation is warranted to determine whether the nature of the association between work-related factors and sick leave varies considerably based on occupation type.

The purpose of the present longitudinal study was to further examine the association between work-related factors (ie, job strain, work hours, commuting time, and job security) and sick leave in a heterogeneous sample of Australian employees. We focused specifically on full-time employees (ie, ≥ 35 hours/week) who account for 63.3% of the working population in Australia.²⁸ We did not include part-time employees as the nature of the associations between work-related factors and sick leave could vary considerably between full-time and part-time employees. We examined the relationship between work and sick leave in the total sample, and then separately by type of occupation. This was to provide an indication of whether the nature of these associations varied by occupation type.

METHODS

Participants and Procedure

The household, income, and labor dynamics in Australia (HILDA) survey is a household panel study that commenced in 2001 and involves follow-up collection every 12 months. The HILDA survey collects a diverse range of information including demographic factors, health behaviors, the psychosocial work environment, and paid sick leave. The present study

utilized data from four waves of the HILDA study (waves 5, 6, 7, and 8) collected between 2005 and 2008. Ethical approval to use the HILDA data for the purposes of the present paper was obtained from the university's Human Research Ethics Committee. In this article, we only included participants who were employed full-time at each time point, provided complete data at baseline (ie, wave 5), and provided sick leave data at each of the four waves.

Measures

In wave 5 (the baseline for the present study), participants were asked the following question: “During the last 12 months, have you taken any paid sick leave?.” Participants who answered “no” were scored as having 0 days of sick leave, whereas those who responded “yes” were asked to indicate the number of sick leave days taken in the past 12 months. Rather than examining sick leave as a continuous variable, the data were recoded to provide categories of sick leave to aid the interpretability of results. There is a lack of relevant data regarding patterns of sick leave in Australian employees.²⁹ The data that are available indicate that the average amount of sick leave taken each year varies from 4 to 8 days a year depending on sector type (eg, public versus private sector) and state of employment.²⁹ In the present study, the average amount of sick leave taken each year was 3 days. This value is likely to be lower given that the sick leave data in this article were self-reported, which may underestimate the amount of sick leave. Therefore, we created categories of sick leave on the basis of tertiles to provide an indication of short (0 days of sick leave), medium (1 to 4 days of sick leave), and long (≥ 5 days of sick leave).

The questions regarding paid sick leave were asked again in waves 6, 7, and 8. The amount of sick leave taken in each of these years was summed to provide an indication of total sick leave over the 3-year period. We then categorized these data into three groups (0 to 2 days, 3 to 12 days, and >12 days), which correspond with the tertiles of sick leave at baseline (wave 5).

A range of occupational measures assessed at wave 5 were included in the analyses. The HILDA survey included 13 items that assessed aspects of the psychosocial work environment such as work intensity (eg, “I have to work very intensely in my job”) and control over work (eg, “I have a lot of freedom to decide how I do my own work”). Exploratory factor analysis with direct oblimin rotation was performed and identified two distinct factors, which were labelled job demands and job control. On the basis of Karasek's⁶ Demand/Control Model, the demand and control factors were split at their medians to create the following four categories: passive (ie, low demands and low control), low strain (ie, low demands and high control), active (ie, high demands and high control), and high strain (ie, high demands and low control).

Participants were also asked to indicate the hours they typically worked each week (coded as 35 to 39 hours, 40 to 49 hours, 50 hours and more), the time spent commuting to and from work each week (split into tertiles ≤ 2 hours; > 2 hours and ≤ 5 hours; > 5 hours), and work schedule (coded as “regular day shift” and “other”). Level of job security was assessed via three questions (eg, “I worry about the future of my job”) each assessed on a seven-point Likert scale. These three items were summed and split into tertiles to provide an index of low, medium, and high job security. Finally, occupation type was determined according to the Australian and

New Zealand Standard Classification of Occupations.³⁰ We combined similar occupation types to provide three categories (“managers/professionals,” “laborers/tradespeople,” and “administrative/retail”) with sufficiently large sample sizes to be included in the analyses.

Demographic information was collected on age, sex, number of children younger than 15 years living at home (coded as 0, 1, 2, >=3) and marital status (married/de facto, single). Socioeconomic status was assessed using the Socioeconomic Indexes for Areas (SEIFA) index of relative socioeconomic advantage and disadvantage.³¹ This provides an index of qualifications, income, and skilled occupation. Scores were split at the median to provide an indication of high and low levels of disadvantage. Baseline health status as assessed by the SF-36 General Health and Vitality subscales³² was also included. These two scales were coded as low (<50), average (50 to 70) and high (>70) health. These demographic, socioeconomic, and health variables were included as covariates in the analyses.

Statistical Analysis

The data were analyzed using multinomial logistic regression models to examine whether the occupational factors (ie, job strain, work hours, commuting time, job type, job security, and work schedule) were significantly associated with total sick leave over the 3-year period. Covariates included in the model were age, sex, socioeconomic status, number of children, marital status, general health, vitality, and baseline sick leave. This approach was repeated for each of the three occupational types separately. Since each model involved two comparisons (0 to 2 days versus 3 to 10 days and 0 to 2 days versus >=11 days), statistical significance was determined at the .025 level to reduce the chance of a type 1 error.

RESULTS

A total of 4399 full-time employees provided complete data in wave 5; the number of full-time employees declined to 3723 in wave 6, 3209 in wave 7, and 2861 in wave 8. Thus, the final sample consisted of 2861 full-time employees who provided complete data at baseline and sick leave data at each time-point. The main reasons for the decline in sample size related to changes in work hours rather than missing data. Individuals who were excluded from the paper were more likely to be younger, female, and single. It is possible that over the 4-year period, these individuals changed their working arrangements in response to lifestyle changes such as having children and/or getting married.

Table 1. Summary of sample characteristics broken down by occupation type

	Labourer/ Trade (n = 877)	Administration/ Retail (n = 725)	Managers/ Professionals (n = 1259)	Total sample (n = 2861)	P value
Age, mean (SD)	37.8 (11.6)	39.6 (11.4)	40.9 (10.5)	39.6 (11.2)	< .001
Sex, n (%)					< .001
<i>Males</i>	795 (90.6)	369 (50.9)	822 (65.3)	1986 (69.4)	
<i>Females</i>	82 (9.4)	356 (49.1)	437 (34.7)	875 (30.6)	
Baseline Sick Leave, n (%)					< .001
0 days	426 (48.6)	221 (30.5)	288 (22.9)	693 (24.2)	
1 – 4 days	267 (30.4)	255 (35.2)	455 (36.1)	977 (34.1)	
≥ 5 days	184 (21.0)	249 (34.3)	516 (41.0)	1191 (41.6)	
3-year sick					< .001

leave, n (%)					
0 – 2 days	320 (36.5)	161 (22.2)	436 (34.6)	917 (32.1)	
3 – 12 days	325 (37.1)	296 (40.8)	485 (38.5)	1106 (38.7)	
≥ 13 days	232 (26.5)	268 (37.0)	338 (26.8)	838 (29.3)	
Work hours, n (%)					< .001
35 – 39 hours	265 (30.2)	240 (33.1)	186 (14.8)	635 (22.2)	
40 – 49 hours	403 (46.0)	347 (47.9)	533 (42.3)	1283 (44.8)	
≥ 50 hours	209 (23.8)	138 (19.0)	540 (42.9)	943 (33.0)	
Job security, n (%)					< .001
Low	328 (37.4)	192 (26.5)	334 (26.5)	854 (29.8)	
Medium	335 (38.2)	283 (39.0)	506 (40.2)	1124 (39.3)	
High	214 (24.4)	250 (34.5)	419 (33.3)	883 (30.9)	
Job Strain, n (%)					< .001
Passive	180 (20.5)	125 (17.2)	578 (45.9)	883 (30.9)	
Low Strain	214 (24.4)	194 (26.8)	253 (20.1)	661 (23.1)	
Active	337 (38.4)	244 (33.7)	129 (10.2)	710 (24.8)	
High Strain	146 (16.6)	162 (22.3)	299 (23.7)	607 (21.2)	
Travel Time, n (%)					.323
≤ 2 hrs	267 (30.4)	234 (32.3)	360 (28.6)	861 (30.1)	
>2 & ≤ 5hrs	271 (238)	173 (23.9)	337 (26.8)	748 (26.1)	
> 5 hrs	372 (42.4)	318 (43.9)	562 (44.6)	1252 (43.8)	
Schedule, n (%)					< .001
Day shift	687 (78.3)	561 (77.4)	1080 (85.8)	2328 (81.4)	
Other	190 (21.7)	164 (22.6)	179 (14.2)	533 (18.6)	

Table 1 summarizes the main demographic characteristics of the final sample broken down by occupation type. Overall, the sample included more males (69.4%) than females (30.6%). There were also some differences in characteristics between the three occupation groups. In particular, the majority of laborers/tradespeople were male (90.6%) compared to the other two groups where the proportion of males and females was more similar. Managers/professionals were more likely to work long hours (ie, ≥ 50 hours) and have high strain jobs. Laborers/tradespeople were more likely to have low job security, whereas those in administration/retail were had an increased likelihood of taking more sick leave.

The results of the regression model examining the association between occupational factors and sick leave for the total sample are shown in Table 2. Although two comparisons were performed (ie, 3 to 10 days versus 0 to 2 days and ≥ 13 days versus 0 to 2 days), we focus on the results for ≥ 13 days of sick leave in the remainder of this article. The results indicate that high job strain (OR = 3.16 [2.18 to 4.58]), active jobs (OR = 2.06 [1.45 to 2.92]), longer commuting times (OR = 1.66 [1.25 to 2.19]) and working in administration/retail (OR = 1.53 [1.11 to 2.10]) were significantly associated with an increased likelihood of long sick leave. Compared to 35 to 39 hours, individuals who worked 40 to 49 hours (OR = 0.54 [0.40 to 0.74]) or ≥ 50 hours a week (OR = 0.30 [0.21 to 0.43]) were significantly less likely to report long sick leave.

Table 2. The association between occupational factors and sick leave in the total sample (**n = 2861**)

	3 – 12 days	13+ days
Work hours		
<i>35 – 39 hours</i>	Ref	Ref
<i>40 – 49 hours</i>	0.76 [0.57 – 1.01]	0.54* [0.40 – 0.74]

<i>50 + hours</i>	0.49* [0.36 – 0.67]	0.30* [0.21 – 0.43]
Job security		
<i>Low</i>	1.02 [0.78 – 1.34]	0.83 [0.61 – 1.13]
<i>Medium</i>	1.18 [0.92 – 1.51]	1.04 [0.78 – 1.39]
<i>High</i>	Ref	Ref
Job Strain		
<i>Passive</i>	1.16 [0.88 – 1.53]	1.36 [0.97 – 1.91]
<i>Low Strain</i>	Ref	Ref
<i>Active</i>	1.60* [1.19 – 2.15]	2.06* [1.45 – 2.92]
<i>High Strain</i>	2.18* [1.57 – 3.01]	3.16* [2.18 – 4.58]
Travel Hours		
≤ 2 hrs	Ref	Ref
>2 & ≤ 5 hrs	1.48* [1.13 – 1.94]	1.36 [1.00 – 1.86]
> 5 hrs	1.80* [1.41 – 2.30]	1.66* [1.25 – 2.19]
Schedule		
<i>Regular Day shift</i>	Ref	Ref
<i>Other</i>	0.65* [0.50 – 0.86]	1.04 [0.77 – 1.40]
Job Type		
Labourer/Trade	0.98 [0.75 – 1.27]	1.03 [0.75 – 1.41]
Administration/Retail	1.44 [1.08 – 1.91]	1.53* [1.11 – 2.10]
Managers/Professionals	Ref	Ref

Controlling for age, sex, socio-economic status, number of children, marital status, general health, vitality and baseline sick leave.

* $p < .025$

The results for the three separate occupations are shown in Table 3. In laborers/tradespeople, working 40 to 49 hours (OR = 0.49 [0.29 to 0.83]) or ≥ 50 hours a week (OR = 0.37 [0.20 to 0.65]) was associated with a reduced likelihood of long sick leave.

Compared to low job strain, active (OR = 2.55 [1.48 to 4.40]), and high strain jobs (OR = 3.78 [1.87 to 7.62]) were also associated with an increased likelihood of long sick leave.

Table 3. Work factors associated with long sick leave (i.e. 11+ days versus < 2 days) broken down by occupation type

	Labourers/ Tradespeople	Administration/ Retail	Managers/ Professionals
Work hours			
<i>35 – 39 hours</i>	Ref	Ref	Ref
<i>40 – 49 hours</i>	0.49* [0.29 – 0.83]	0.54 [0.30 – 0.95]	0.57 [0.32 – 1.01]
<i>50 + hours</i>	0.37* [0.20 – 0.65]	0.36* [0.17 – 0.74]	0.24* [0.13 – 0.43]
Job security			
<i>Low</i>	0.83 [0.48 – 1.41]	0.72 [0.38 – 1.38]	0.66 [0.43 – 1.01]
<i>Medium</i>	0.71 [0.42 – 1.21]	0.96 [0.54 – 1.70]	1.51 [0.96 – 2.36]
<i>High</i>	Ref	Ref	Ref
Job Strain			
<i>Passive</i>	1.47 [0.78 – 2.76]	1.25 [0.60 – 2.62]	1.55 [0.92 – 2.61]
<i>Low Strain</i>	Ref	Ref	Ref
<i>Active</i>	2.55* [1.48 – 4.40]	1.65 [0.87 – 3.14]	2.15 [1.03 – 4.51]
<i>High Strain</i>	3.78* [1.87 – 7.62]	2.51* [1.20 – 5.25]	3.53* [1.95 – 6.41]
Travel Hours			
<i>0 – 2 hours</i>	Ref	Ref	Ref
<i>> 2 ≤ 5 hours</i>	1.38 [0.84 – 2.25]	1.93 [1.00 – 3.71]	1.04 [0.63 – 1.72]

> 5 hours	1.42 [0.83 – 2.42]	2.38* [1.33 – 4.27]	1.41 [0.89 – 2.22]
Schedule			
Regular Day shift	Ref	Ref	Ref
Other	1.26 [0.77 – 2.06]	1.14 [0.64 – 2.04]	0.59 [0.34 – 1.05]

Controlling for age, sex, socio-economic status, number of children, marital status, general health, vitality and baseline sick leave.

In administrative/retail, working ≥ 50 hours a week (OR = 0.36 [0.17 to 0.74]) was associated with reduced odds of long sick leave. Longer commuting times (OR = 2.38 [1.33 to 4.27]) and high strain jobs (OR = 2.51 [1.20 to 5.25]) were associated with an increased risk of long sick leave. In managers/professionals, high job strain (OR = 3.53 [1.95 to 6.41]) was associated with an increased likelihood of long sick leave. Working 50 hours or more a week (OR = 0.24 [0.13 to 0.43]) was associated with a reduced likelihood of long sick leave.

DISCUSSION

The present study identified several work-related factors associated with sick leave in a sample of full-time Australian employees. High strain and active jobs, along with longer commuting time were associated with longer sick leave over a 3 year period. In contrast, long working hours were inversely associated with sick leave. The results also demonstrated that individuals employed in the administration/retail sector were significantly more likely to take longer sick leave.

The observed association between job strain and sick leave is consistent with a number of existing studies,^{1,4,9,10,13} and could reflect a number of factors. First, it is possible that job strain contributes to sick leave indirectly by contributing to health problems.⁴ Research has consistently demonstrated that high job strain is associated with a range of health conditions such as cardiovascular disease and mental health problems, which are likely to contribute to

absenteeism.⁷⁻⁹ Alternatively, employees in high strain jobs may take more sick leave as a coping mechanism to reduce work-related stress and rejuvenate themselves.^{4,13} Ultimately, this practice could benefit the health of the employee by minimizing stress and avoiding chronic disease, but still represents a financial cost to employers and organizations.

Although active jobs are characterized by high decision latitude, they are also characterized by high psychological demands. Therefore, it is possible that the mechanisms underlying the observed association between active jobs and sick leave are similar to those for high strain jobs and sick leave.

The observed association between commuting time and sick leave has not been widely reported. Taylor and Pocock²⁴ found that longer commuting times (eg, > 1.5 hours a day) were associated with more uncertified sickness absences, but few other studies have been conducted. However, research has demonstrated that aspects of commuting to and from work such as long duration, long distance, and traffic congestion are associated with increased stress.^{22,23} Longer commuting time may also exacerbate the effects of job strain on health. Thus, it is possible that employees with a longer commute experience greater stress and stress-related illness (eg, hypertension), and hence need to take more sick leave. Similar to high job strain, employees with a longer commute may also take more sick leave as a coping mechanism to minimize stress. These issues are likely to become increasingly important in Australia as the growing population and expanding urbanization may contribute to increased commuting time and distance.

Interestingly, we found that individuals who worked long hours were less likely to take long sick leave. This finding appears counterintuitive because long work hours are associated with poorer physical and mental health,³³ which may be expected to predict increased sick leave. However, it is becoming increasingly recognized that many employees continue

working despite suffering from an illness or medical condition.³⁴⁻³⁶ This phenomenon has been termed presenteeism, and is a largely “hidden” problem that has a range of adverse long-term health effects (eg, burnout), resulting in higher health care costs and lower productivity.³⁶ Long work hours have been associated with higher presenteeism,³⁵ which may reflect high job commitment, or workplace cultures that disapprove of employees taking sick leave,^{37,38} Presenteeism was not assessed in the present study but could account for the association between long work hours and reduced sick leave.

This study also demonstrated a number of similarities in the associations between work-related factors and sick leave. In all groups, long work hours were inversely associated with sick leave suggesting that presenteeism may be a common element of many occupation types. Although this requires further investigation, both employees and employers may need to consider that longer hours could actually be reducing productivity. Job strain was also associated with sick leave across all groups, albeit with the relationship considerably stronger in managers/professionals and laborers/tradespeople. Thus, interventions aimed at improving the psychosocial work environment and providing more coping and stress management strategies may be effective in improving health and reducing sick leave across a range of occupations. Furthermore, identifying and modifying job cultural factors (eg, occupations where sick leave is discouraged among peers) will likely be important. In terms of group differences, active jobs (ie, high psychological demands and high decision latitude) were associated with sick leave in laborers/tradespeople only, whereas commuting time was also associated with sick leave in administration/retail jobs. These findings require confirmation in other studies but suggest that unique aspects of different work environments may also be contributing to sick leave and need to be considered.

There are some important limitations of the present study that warrant discussion. Sick leave was based on self-report, which may lack accuracy and underestimate total sick leave.

However, this may not be a major limitation given that there is generally a high level of agreement between recorded and self-reported sick leave.^{39,40} A further potential limitation is that we were unable to determine the reason for each sick leave period, and hence could not distinguish between medically verified and unverified sick leave. Some studies conducted in Finland and Norway have examined computerized records of sick leave that are centrally recorded by the respective governments. In Australia there is no central record although many organizations do keep records of sick leave. Given the nature of the present study, which included multiple occupation types, it was not feasible or practical to access these records. A further limitation is that we did not have a measure of presenteeism, which may shed light on the link between long work hours and reduced sick leave.

A major strength of the current study involved the examination of a wide variety of occupational factors, in addition to the inclusion of factors such as commute time, which have not been examined widely in this context. The ability to distinguish between different occupational groups provides important insights into how these associations vary across occupations. Future research in this context using larger sample sizes and allowing for comparisons between more specific occupation groups will further benefit our understanding of this area.

The present results have a number of important implications not only for the health and well-being of employees, but also for organizations and businesses. In particular, high strain jobs are associated with a range of chronic health conditions that adversely affect the health and well-being of the employee but also have adverse implications for productivity. Thus, employers and organizations should aim to improve the psychosocial work

environment to influence absence levels.¹⁵ This should also involve ensuring that employees are encouraged to take sick leave if they are ill or injured. Rather than reducing productivity (which might be expected), this would likely improve productivity in the long term and ultimately improve the health and well-being of employees.

What this paper adds?

- The present study demonstrates that job strain and long commuting time are associated with longer sick leave. In contrast, long work hours and low job security are associated with reduced odds of sick leave.
- Some of these associations **between work and sick leave** were found to differ by occupation type.
- These results have important implications for organisational policy. In particular, organisations need to target factors contributing to **sick leave** to improve employee health and workplace productivity.

REFERENCES

1. Moreau M, Valente F, Mak R, *et al.* Occupational stress and incidence of sick leave in the Belgian workforce: The Belstress study. *J Epidemiol Community Health* 2004;**58**:507-16.
2. Niedhammer I, Bugel I, Goldberg M, *et al.* Psychosocial factors at work and sickness absence in the Gazel cohort: A prospective study. *Occup Environ Med* 1998;**55**:735-41.
3. Henderson M, Glozier N, Elliot KH. Long term sickness absence. *Br Med J* 2005;**330**:802 - 3.
4. Kristensen TS. Sickness absence and work strain among Danish slaughterhouse workers: An analysis of absence from work regarded as coping behaviour. *Soc Sci Med* 1991;**32**:15-27.
5. North FM, Syme SL, Feeney A, *et al.* Psychosocial work environment and sickness absence among British civil servants: The Whitehall II study. *Am J Public Health* 1996;**86**:332-40.
6. Karasek R. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Admin Sci Quart* 1979;24(2):285 - 308.
7. Johnson JVS, W, Hall EM, Fredlund P, *et al.* Long-term psychosocial work environment and cardiovascular mortality among Swedish men. *Am J Public Health* 1996;86(3):324-31.
8. Sanne B, Mykletun A, Dahl AA, *et al.* Testing the Job Demand-Control-Support model with anxiety and depression as outcomes: The Hordaland Health Study. *Occup Med* 2005;**55**:463-73.

9. Virtanen M, Vahtera J, Pentti J, *et al.* Job strain and psychologic distress: Influence on sickness absence among Finnish employees. *Am J Prev Med* 2007;**33**:182 - 7.
10. Bourbonnais R, Mondor M. Job strain and sickness absence among nurses in the province of Quebec. *Am J Ind Med* 2001;**39**:194-202.
11. Holden L, Scuffham PA, Hilton MF, *et al.* Work performance decrements are associated with Australian working conditions, particularly the demand to work longer hours. *J Occup Environ Med* 2010;**52**:281-90.
12. Ishikazi M, Kawakami N, Honda R, *et al.* Psychosocial work characteristics and sickness absence in Japanese employees. *Int Arch Occup Environ Health* 2006;**79**:640-6.
13. Kondo K, Kobayashi Y, Hirokawa K, *et al.* Job strain and sick leave among Japanese employees: A longitudinal study. *Int Arch Occup Environ Health* 2006;**79**:213-219.
14. Nielsen ML, Rugulies R, Christensen KB, *et al.* Psychosocial work environment predictors of short and long spells of registered sickness absence during a 2-year follow up. *J Occup Environ Med* 2006;**48**:591-8.
15. Roelen CAM, Weites SH, Koopmans PC, *et al.* Sickness absence and psychosocial work conditions: A multilevel study. *Occup Med* 2008;**58**(6):425-430.
16. Darr W, Johns G. Work strain, health, and absenteeism: a meta-analysis. *J Occup Health Psychol* 2008;**13**:293-318.
17. Laaksonen M, Pitkaniemi J, Rahkonen O, *et al.* Work arrangements, physical working conditions, and psychosocial working conditions as risk factors for sickness absence: Bayesian analysis of prospective data. *Ann Epidemiol* 2010;**20**:332-8.
18. Melchior M, Niedhammer I, Berkman LF, *et al.* Do psychosocial work factors and social relations exert independent effects on sickness absence? A six year prospective study of the GAZEL cohort. *J Epidemiol Community Health* 2003;**57**:285-93.

19. Rugulies R, Christensen KB, Borritz M, *et al.* The contribution of the psychosocial work environment to sickness absence in human service workers: Results of a 3-year follow-up study. *Work Stress* 2007;**21**:293-311.
20. Australian Bureau of Statistics. *NSW State and Regional Indicators, June 2010*. Canberra: Australian Bureau of Statistics, 2010.
21. US Census Bureau. *Journey to Work: 2000*. Washington DC: US Census Bureau, 2004.
22. Kageyama T, Nishikido N, Kobayashi T, *et al.* Long commuting time, extensive overtime, and sympathodominant state assessed in terms of short-term heart rate variability among male white-collar workers in the Tokyo megalopolis. *Ind Health* 1998;**36**:209-17.
23. White SM, Rotton J. Type of Commute, Behavioral Aftereffects, and Cardiovascular Activity : A Field Experiment *Environ Behav* 1998;**30**:763-780.
24. Taylor PJ, Pocock SJ. Commuter travel and sickness absence of London office workers. *Br J Prev Soc Med* 1972;**26**:165 - 172.
25. Ala-Mursula L, Vahtera J, Linna A, *et al.* Employee worktime control moderates the effects of job strain and effort-reward imbalance on sickness absence: The 10-town study. *J Epidemiol Community Health* 2005;**59**:851-7.
26. Christensen KB, Nielsen ML, Rugulies R, *et al.* Workplace levels of psychosocial factors as prospective predictors of registered sickness absence. *J Occup Environ Med* 2005;**47**:933-40.
27. Pousette A, Johansson Hanse J. Job characteristics as predictors of ill-health and sickness absenteeism in different occupational types - A multigroup structural equation modelling approach. *Work Stress* 2002;**16**:229-50.
28. Australian Bureau of Statistics. *Employee earnings and hours*. Canberra: Bureau of Statistics, 2010.

29. Department of Premier and Cabinet. *Sick Leave: Department of Premier and Cabinet*. Sydney: New South Wales Audit Office, 2010.
30. Australian Bureau of Statistics. *ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1*. Canberra: Australian Bureau of Statistics, 2006.
31. Australian Bureau of Statistics. *An Introduction to Socio-Economic Indexes for Areas (SEIFA)*. Canberra: Australian Bureau of Statistics, 2006.
32. Ware JE, Kosinski M, Gandek B. *SF-36 Health Survey Manual & Interpretation Guide*. Lincoln: RI: QualityMetric Incorporated, 1993, 2000.
33. Sparks K, Cooper C, Fried Y, *et al*. The effect of hours of work on health: A meta-analytic review. *J Occup Organ Psych* 1997;**70**:391 - 408.
34. Demerouti E, Le Blanc PM, Bakker AB, *et al*. Present but sick: a three-wave study on job demands, presenteeism and burnout. *Career Dev Int* 2009;**14**:50 - 68.
35. Hansen CD, Andersen JH. Going ill to work – What personal circumstances, attitudes and work-related factors are associated with sickness presenteeism? *Soc Sci Med* 2008;**67**:956 - 64.
36. Hemp P. Presenteeism: at work-but out of it. *Harvard Bus Rev* 2004;**October**:49 - 58.
37. Grinyer A, Singleton V. Sickness absence as risk-taking behaviour: A study of organisational and cultural factors in the public sector. *Hlth, Risk & Soc* 2000;**2**:7 - 21.
38. McKeivitt C, Morgan M, Dundas R, Holland WW. Sickness absence and 'working through' illness: a comparison of two professional groups. *J Public Health Med* 1997;**19**:295 - 300.
39. Ferrie JE, Kivimäki M, Head J, *et al*. A comparison of self-reported sickness absence with absences recorded in employers' registers: evidence from the Whitehall II study. *Occup Environ Med* 2005;**62**:74 - 9.

40. Voss M, Stark S, Alfredsson L, *et al.* Comparisons of self-reported and register data on sickness absence among public employees in Sweden. *Occup Environ Medic* 2008;**65**:61

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