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Health effects of anticipation of job change and non-employment: longitudinal data from the Whitehall II study

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See p 1282, 1285

Abstract

Objective—To assess the effect of anticipating job change or non-employment on self reported health status in a group of middle aged male and female white collar civil servants.

Design—Longitudinal cohort study (Whitehall II study). Questionnaire data on self reported health status and health behaviour were obtained at initial screening and four years later, during the period when employees of the department facing privatisation were anticipating job change or job loss.

Setting—London based office staff in 20 civil service departments.

Subjects—666 members of one department threatened with early privatisation were compared with members of the 19 other departments.

Main outcome measures—Self reported health status measures and health related behaviours, before and during anticipation of privatisation.

Results—In comparison to the remainder of the cohort, the profile of health related behaviours of cohort members who faced privatisation was more favourable, both before and during anticipation of privatisation. There were no significant differences in the changes in health behaviours between cohort members moving into a period of job insecurity and the remainder of the cohort. Self reported health status, however, tended to deteriorate among employees anticipating privatisation when compared with that of the rest of the cohort.

Conclusions—The application of a longitudinal design, allowing the same individuals to be followed from job security into anticipation, provides more robust evidence than has previously been available that anticipation of job loss affects health even before employment status has changed.

Introduction

The health consequences of redundancy and unemployment have been investigated since the period

of high unemployment in the 1930s.¹ These studies have, in general, shown that unemployment is associated with an increased risk of mortality,^{2,4} morbidity,^{5,7} and psychological ill health.⁸⁻¹⁰ Current unemployment in countries of the Organisation for Economic Co-operation and Development (OECD) is at a postwar high of 35 million, and an estimated further 15 million people have either given up looking for work or unwillingly accepted a part time job.¹¹ Therefore the potential of unemployment to damage health constitutes an important, and growing, problem.

Anticipation of redundancy or rationalisation is generally referred to as "the anticipation phase" in studies of the effects of job insecurity on health. It is often cited as being similar in effect on health to unemployment, but few studies have followed their subjects longitudinally from secure employment and into the phase of anticipation of job change or job loss. Furthermore, many previous studies of redundancy have lacked a control group of any kind, and even in the few studies where a control group has been included^{5,12,13} this has seldom been adequately matched to the group experiencing increasing job insecurity or unemployment.¹⁴

A major consideration when examining the relation between health and labour market experience is the extent to which the experience of job insecurity and subsequent events is a consequence, rather than a cause, of ill health. During times of economic contraction the least productive members of any workforce are the most likely to be shed. Therefore ill health may itself lead to a greater risk of unemployment. Similarly, for people in poor health, who recognise that their chances of re-employment are reduced, job insecurity may be a more salient and stressful life event. If this is the case, cross sectional studies of self reported levels of job insecurity and health could reveal associations that are of no causal significance. These issues can be resolved only if baseline data are collected before job loss and study participants are followed up through the entire period of change in employment. The ability to perform such

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a study will rarely arise, since the collection of data before job loss has been anticipated cannot be planned for. The Whitehall II study, however, provides just such an opportunity. We investigated the health effects of job insecurity and the anticipation of job loss in an ongoing prospective study of the health of male and female civil servants,¹⁵ in which data were obtained during a phase of job security for the whole cohort; repeat data collection was performed when one group of the cohort was facing the prospect of job change or unemployment.

Subjects and methods

PARTICIPANTS

The target population for the Whitehall II study was all London based office staff working in 20 civil service departments between 1985 and 1988. With a response rate of 73%, the final cohort consisted of 10 308: 6895 men and 3413 women.¹⁵ The true response rates are likely to be higher, however, because around 4% of those on the list of employees had in fact moved before the study started and were thus not eligible for inclusion. Although most subjects were in non-manual occupations, they covered a wide range of grades from office support staff to permanent secretary. As of 1 January 1987 annual salaries ranged from £62 100 for a permanent secretary to £3061 for the lowest paid office support grade. Baseline screening took place between late 1985 and early 1988. This involved a clinical examination, in which physiological variables including blood pressure, electrocardiography, and serum cholesterol concentration were determined, together with a questionnaire survey that covered sociodemographic variables, health status measures, and health behaviours. In 1990 the second screening collected repeat data by postal questionnaire.

A separate study, specifically to investigate the physical, psychological, and social effects of the privatisation of the Property Services Agency, was initiated in 1994. This study is collecting quantitative data by questionnaire and qualitative data from in depth interviews to cover the experience of the cohort from this department over the privatisation period. The response to the questionnaire has been 80% (531/666) to date.

CONTEXT AND METHODS

Although the Whitehall II study did not originally set out to examine the effects of change in the labour market, the introduction of market forces into the civil service and the privatisation of the first complete civil service department, the Property Services Agency, provided an opportunity to overcome many of the methodological limitations of previous studies of job insecurity. After the restructuring and privatisation was widely reported in the daily press and journals of the construction industry in early 1988, the media continued to give a high profile to the impending privatisation of this department, which culminated in the sale of Property Services Agency Projects, the design and build division of the agency, to the private sector on 1 December 1992.¹⁶ A total of 666 employees of the Property Services Agency, mainly professional and technical staff, had been included in the baseline screening of the Whitehall II study; 526 of them, mostly now in Property Services Agency Projects, completed the follow up questionnaire.

The baseline screening of the Property Services Agency was complete by the end of 1986. In that year a government report, *Using Private Enterprise in Government*,¹⁷ recommended the examination of all government work to determine whether it could be improved by transfer to the private sector or should be jettisoned. Few civil servants would have been aware of the long

term implications of this report at that time as its recommendations were only implemented from August 1988 through the "Next Steps" programme. For the Property Services Agency, however, rationalisation along these lines was being debated somewhat before this. Early in 1988 the future of the agency was envisaged in terms of a trading fund, a plan which had been jettisoned in favour of privatisation by December of the same year.¹⁸ The Property Services Agency Bill laying "the basis for selling off the Property Services Agency, probably in 1992" received its second reading in the House of Commons on 6 December 1989¹⁹ with Christopher Chope, the minister responsible for the Property Services Agency, forecasting "significant" staff cuts in the run up to the privatisation.²⁰ These were to be in addition to the 10% shrinkage in professional and technical staff that had already taken place in the 12 months to April 1989.²¹

Professional journals reported that by March 1988 staff of the Property Services Agency were "becoming demoralised at the continuing uncertainty surrounding the agency's future,"²² a situation which deteriorated over the coming months. Thus at the time of the postal questionnaire it was widely recognised that the Property Services Agency was in line for major change leading to eventual privatisation, and the employees were consequently anticipating job change, redundancy, or early retirement. By 1994, 43% of the Property Services Agency cohort were no longer in paid employment, and of those in work 52% considered their job to be insecure, indicating that these fears were not misplaced. It is therefore appropriate to describe the baseline (1986 for the Property Services Agency) as a period of secure employment for nearly all civil servants, while the follow up (1989 for the Property Services Agency) can be described as the "anticipation phase" for the Property Services Agency and a period of comparative job security for the other departments.

MEASURES

Items drawn from the questionnaire covered personal details (age, marital status, and current grade of employment); health (self rated health over the past 12 months, presence of longstanding illness, presence of 17 different symptoms in the previous 14 days, and presence of recurring health problems based on questions used in the general household survey²³); minor psychiatric morbidity (assessed using the 30 item general health questionnaire²⁴); health related behaviours (current smoking habits, alcohol consumption in past seven days, exercise patterns); and locus of control (the degree to which respondents think they can control their own health). Further details on these measures have been reported previously.¹⁵

An increased score on the general health questionnaire represents an increase in minor psychiatric morbidity. All those scoring 0-4 on this questionnaire are considered "non-cases" and those scoring 5 or more as "cases."²⁵

Alcohol was measured in units, with one unit of alcohol equivalent to half a pint of beer or cider, a single measure of spirits, or a glass of wine. Heavy drinking was defined as >21 units/week for men and >14 units/week for women.

STUDY SAMPLE AND STATISTICAL ANALYSIS

In all, 666 employees of the Property Services Agency were included in the baseline screening (513 men, 153 women), 526 of whom (79%) completed the follow up questionnaire (410 men, 116 women). The other departments contained 9642 respondents (6382 men and 3260 women) at baseline and 7607 respondents (79%; 5123 men and 2484 women) at follow up. In addition to those who failed to return the second

questionnaire, non-responders include participants who had died and those who could not be traced. The size of the two populations was given by the original study design and was determined before this study of anticipation of job change or non-employment started.

Age adjusted means and proportions were calculated by direct standardisation using five year age groups with the total population as the standard. Differences in means were tested by analysis of covariance using the age groups as covariates, while differences in proportions were assessed using Cochran-Mantel-Haenszel tests of association. For all continuous variables, repeating the analyses after logarithmic transformation does not materially alter the results.

The main aim of the analysis was to compare the changes in the various measures between baseline and follow up (the anticipation phase for those in the Property Services Agency) with those in other departments. It has been recognised that such data cannot be analysed by using simple differences because the magnitude of the change would depend on the level at baseline.^{26 27} An imbalance in the means (or percentages) at baseline between the Property Services Agency and the other departments would result in comparison of the simple differences being biased. For continuous variables, therefore, differences at the anticipation phase (follow up) were assessed by using analysis of covariance with age, employment grade, and the baseline level of the variable of interest as covariates. To calculate adjusted differences in proportions for the dichotomous variables, logistic regression of the values at follow up on the baseline values was used to compute residuals, which were then analysed by using analysis of covariance, with age and employment grade as covariates.

Results

The response rate for the Whitehall II cohort at follow up was 79%, with non-response at 24% for

women and 20% for men in both the Property Services Agency and the other departments. Baseline data for participants who did or did not respond to the follow up questionnaire are presented in table I. Responders and non-responders differed in age, employment grade, self rated health in the last year, smoking, exercise behaviour, and, in men, alcohol consumption. Of relevance to subsequent comparisons, the differences between responders and non-responders are similar for the participants recruited from the Property Services Agency and the other departments, with the exception of employment grade in men; the low response rate in the lower grades seen in the main cohort was not seen in the Property Services Agency cohort.

Table II shows age, grade, marital status, self reported health status, and health related behaviour variables for the Property Services Agency and the other departments at baseline. Any differences between these populations tended to show advantages for the Property Services Agency, which had a more favourable profile of health and health related behaviours than the other departments.

Health status measures as reported in the follow up questionnaire are presented in Table III. The differences in changes from baseline to follow up between the Property Services Agency and other departments are also shown, adjusted for age, employment grade, and measures of self reported health status at baseline. All the measures showed a deterioration in the self reported health of men in the Property Services Agency compared with men in the other departments, which was significant for self rated general health, the number of symptoms experienced over the past two weeks, and the number of health problems over the past year. In women the picture was less consistent, with the only significant difference relating to a relative worsening in the number of symptoms reported by women from the Property Services Agency compared with those in other departments. Table III also shows that change in health related behaviours between baseline and follow up did not differ significantly

TABLE I—Characteristics of responders and non-responders to follow up questionnaire for subjects in the Property Services Agency and other departments at baseline. Values in parentheses are standard errors

	Property Services Agency		Other departments		P value for difference†	P value for test for interaction*
	Responder	Non-responder	Responder	Non-responder		
	<i>Men</i>					
No	410	103	5123	1259		
Mean (SE) age (years)	44.4 (0.3)	43.9 (0.6)	44.2 (0.1)	43.4 (0.2)	<0.001	>0.5
Grade:						
% Administrative	35.4 (2.3)	31.5 (4.4)	40.7 (0.7)	32.6 (1.3)	<0.001	0.42
% Clerical/support	3.6 (0.9)	2.9 (1.6)	8.3 (0.4)	16.8 (1.1)	<0.001	<0.001
Self reported health status measures						
% With self-rated health average or worse	20.9 (2.0)	25.3 (4.4)	21.5 (0.6)	26.5 (1.3)	<0.001	>0.5
% With longstanding illness	28.0 (2.4)	27.4 (4.6)	31.8 (0.8)	29.9 (1.5)	0.25	>0.5
Mean No of symptoms	2.01 (0.11)	1.66 (0.20)	2.48 (0.04)	2.51 (0.08)	>0.5	0.12
No of health problems	1.29 (0.07)	1.23 (0.13)	1.31 (0.02)	1.35 (0.05)	>0.5	>0.5
GHQ caseness	22.4 (2.1)	24.6 (4.3)	25.1 (0.6)	26.2 (1.3)	0.40	>0.5
Health behaviours						
Units alcohol in last week	11.0 (0.6)	11.3 (1.0)	12.6 (0.2)	13.9 (0.5)	0.007	0.43
% Current smokers	10.5 (1.5)	16.5 (3.7)	14.6 (0.5)	22.6 (1.2)	<0.001	>0.5
% Taking no exercise	5.0 (1.1)	6.0 (2.4)	10.9 (0.4)	14.9 (1.0)	<0.001	0.29
	<i>Women</i>					
No	116	37	2484	776		
Mean (SE) age (years)	45.4 (0.6)	43.5 (1.0)	45.2 (0.1)	45.3 (0.2)	>0.5	0.10
Grade:						
% Administrative	3.9 (1.7)	4.6 (2.9)	13.1 (0.7)	9.1 (1.1)	0.005	0.20
% Clerical/support	53.6 (4.7)	68.9 (7.6)	44.8 (1.0)	56.3 (1.8)	<0.001	>0.5
Self reported health status measures						
% With self-rated health average or worse	30.1 (4.2)	38.6 (7.8)	34.5 (1.0)	41.2 (1.8)	<0.001	>0.5
% With longstanding illness	26.7 (4.9)	25.7 (7.4)	31.3 (1.1)	30.6 (2.0)	>0.5	>0.5
Mean No of symptoms	2.59 (0.25)	2.64 (0.57)	3.12 (0.06)	3.16 (0.11)	>0.5	>0.5
No of health problems	1.38 (0.15)	1.53 (0.42)	1.64 (0.04)	1.79 (0.07)	0.11	>0.5
GHQ caseness	28.9 (4.3)	29.6 (7.8)	30.7 (0.7)	31.4 (1.7)	>0.5	>0.5
Health behaviours						
Units alcohol in last week	4.6 (0.5)	4.7 (1.1)	5.6 (0.2)	5.8 (0.3)	>0.5	>0.5
% Current smokers	17.8 (3.4)	21.4 (7.1)	21.1 (0.8)	29.7 (1.7)	<0.001	>0.5
% Taking no exercise	27.3 (4.1)	38.2 (8.0)	27.6 (0.9)	30.3 (1.7)	0.12	0.37

GHQ=general health questionnaire.

*Whether differences between responders and non-responders differ between Property Services Agency and other departments.

†Responders v non-responders for all departments combined.

TABLE II—Age standardised means and percentages (SE) for subjects in Property Services Agency and other departments at baseline

	Men			Women		
	Property Services Agency	Other	P value for difference	Property Services Agency	Other	P value for difference
Age (years)	44.4 (0.3)	44.2 (0.1)	>0.5	45.4 (0.6)	45.3 (0.1)	>0.5
Grade:						
% Administrative	35.4 (2.3)	40.7 (0.7)		3.9 (1.7)	13.0 (0.7)	
% Professional/executive	61.0 (2.4)	51.0 (0.7)	<0.001***	42.5 (0.6)	42.2 (0.1)	0.009**
% Clerical/support	3.6 (0.9)	8.3 (0.4)		53.6 (4.7)	44.8 (1.0)	
Marital status:						
Married/cohabiting	87.7 (1.6)	81.7 (0.5)		64.8 (4.5)	61.2 (1.0)	
Single	7.8 (1.3)	13.5 (0.5)	<0.001***	18.4 (3.6)	22.2 (0.8)	0.47
Divorced	4.2 (1.0)	4.4 (0.3)		10.8 (2.9)	13.9 (0.7)	
Widowed	0.3 (0.3)	0.4 (0.1)		5.9 (2.2)	2.6 (0.3)	
Self reported health status measures						
% With self rated health average or worse	20.9 (2.0)	21.5 (0.6)	>0.5	30.1 (4.2)	34.5 (1.0)	0.44
% With longstanding illness	28.0 (2.4)	31.8 (0.8)	0.13	26.7 (4.9)	31.3 (1.1)	0.36
Mean No of symptoms	2.01 (0.11)	2.48 (0.04)	<0.001***	2.59 (0.25)	3.12 (0.06)	0.07
No of health problems	1.29 (0.07)	1.31 (0.02)	>0.5	1.38 (0.15)	1.64 (0.04)	0.13
GHQ score	3.05 (0.23)	3.41 (0.07)	0.18	4.09 (0.64)	4.09 (0.12)	>0.5
GHQ caseness	22.4 (2.1)	25.1 (0.6)	0.21	28.9 (4.3)	30.7 (0.7)	>0.5
Health behaviours						
Units alcohol in last week	11.0 (0.6)	12.6 (0.2)	0.03*	4.6 (0.5)	5.6 (0.2)	0.16
% Non-drinkers	11.9 (1.6)	12.9 (0.5)	>0.5	29.3 (4.3)	28.2 (0.9)	>0.5
% Heavy drinkers	11.9 (1.6)	18.1 (0.5)	0.002**	3.4 (1.6)	10.1 (0.6)	0.03*
% Current smokers	10.5 (1.5)	14.6 (0.5)	0.02*	17.8 (3.4)	21.1 (0.8)	>0.5
% Taking no exercise	5.0 (1.1)	10.9 (0.4)	<0.001	27.3 (4.1)	27.6 (0.9)	>0.5
% With external locus of control	30.0 (2.4)	31.0 (0.8)	>0.5	35.5 (5.0)	39.1 (1.1)	>0.5

GHQ=general health questionnaire. *P<0.05, **P<0.01, ***P<0.001.

TABLE III—Age standardised means of self reported health status and health behaviours in the Property Services Agency and other departments at follow up

	Property Services Agency	Other	Difference	Adjusted difference (SE)*	P value†
<i>Self reported health status</i>					
% With self rated health average or worse					
Men	27.0	21.8	5.2	6.0 (2.0)	0.004
Women	33.2	36.8	-3.6	-3.6 (3.8)	0.34
% With longstanding illness					
Men	37.0	35.9	1.1	3.3 (2.3)	0.16
Women	31.5	38.4	-6.9	-4.7 (4.7)	0.32
Mean No of symptoms					
Men	2.73	2.63	0.10	0.36 (0.11)	0.004
Women	3.65	3.35	0.30	0.55 (0.23)	0.02
No of health problems					
Men	1.48	1.37	0.11	0.12 (0.06)	0.05
Women	1.70	1.76	-0.06	0.09 (0.13)	0.49
GHQ score					
Men	3.75	3.72	0.03	0.21 (0.27)	0.44
Women	5.37	4.70	0.67	0.71 (0.51)	0.16
GHQ caseness					
Men	28.1	27.3	0.8	1.8 (2.3)	0.44
Women	37.6	33.8	3.8	3.9 (4.2)	0.35
<i>Health behaviours</i>					
Alcohol (units/week)					
Men	10.9	12.4	-1.5	-0.4 (0.4)	0.40
Women	4.5	5.2	-0.7	0.2 (0.8)	>0.5
% Non-drinkers					
Men	16.0	14.2	1.8	3.1 (1.7)	0.08
Women	34.5	30.5	4.0	2.5 (3.2)	0.43
% Heavy drinkers					
Men	15.1	17.4	-2.3	0.7 (1.5)	>0.5
Women	6.8	8.7	-1.9	2.4 (2.8)	0.38
% Current smokers					
Men	8.7	13.4	-4.7	-0.9 (1.0)	0.36
Women	20.2	19.5	0.7	3.5 (1.8)	0.06
% Taking no exercise					
Men	5.4	8.8	-3.4	-1.6 (1.6)	0.32
Women	20.1	19.7	0.5	-0.2 (3.0)	>0.5
% With external locus of control					
Men	21.4	25.2	-3.8	-3.61 (2.3)	0.12
Women	38.2	31.4	6.8	8.32 (4.7)	0.07

*Adjusted for age, grade and for baseline values.

†Whether the adjusted difference is significantly different from zero.

between the Property Services Agency and other departments.

Discussion

From an initial position either of advantage or no difference to the rest of the cohort, employees in the Property Services Agency experienced a relative overall deterioration in self reported morbidity during the anticipation phase. This deterioration was not accompanied by a consistent worsening in the profile of health related behaviours.

METHODOLOGICAL CONSIDERATIONS

Most studies of job insecurity or job loss reported so

far have been cross sectional—with concurrent control groups of workers in similar workplaces unaffected by job change—or have compared the anticipation phase or unemployment with health after re-employment. Fewer studies have followed subjects and controls from before the anticipation phase, and studies with a longitudinal design have mainly used retrospective methods to collect data from before the anticipation phase. The present study, therefore, represents a substantial improvement on the methodology of earlier research on this topic.

A potential problem with this study is that data are available only for participants who responded both to the initial survey and to the follow up questionnaire. The possibility of bias being introduced by differential

loss to follow up in the Property Services Agency and other departments was explored in detail by comparing baseline characteristics of responders and non-responders. There was no evidence that the association between health status or profile of health related behaviours and probability of responding to the follow up questionnaire differed substantially between the Property Services Agency and other departments. The main difference, of higher response rates among higher grades in the main cohort but not in the Property Services Agency, would tend to bias the results away from finding relative deterioration in health status in the Property Services Agency.

The measures of health status used in this study are all based on self reports. The way in which health status is reported could be changed by impending job change and possible job loss. This process might be expected to influence reporting of longstanding illness more than general health status, as longstanding illness is the prerequisite for permanent exit from the labour market on medical grounds. In the present study, however, general health status measures rather than longstanding illness showed relative deterioration in the Property Services Agency.

EFFECTS OF ANTICIPATION ON HEALTH STATUS

The adverse effect that the period of anticipation of job change or unemployment has on health status is consistent with results from one of the few prospective studies in the field, Kasl and Cobb's factory closure study in Michigan.¹² The phase of anticipation of plant closure had a detrimental effect on the number of days per fortnight on which the respondent "did not feel as well as usual." The Michigan study showed no effect of anticipation on symptom score, but our study showed significant relative increases in symptom scores for the Property Services Agency men and women between baseline and follow up in comparison to employees in other departments. Together with the relative deterioration in health problems among men in the Property Services Agency, these changes might be expected to translate into the increased incidence of illness and use of health services found in the follow up of the Harris factory closure at Calne in Wiltshire.²⁸

Self reported health status is not a clinically insignificant measure. Five recent epidemiological studies have now found that self reported health status predicts mortality over a period of years, even after adjustment for physical ill health at baseline.²⁹ Moreover this association does not seem to be explained away by confounding factors, inappropriate analysis techniques, involvement with medical care, social support, or internal resources such as depression and optimism.²⁹

The degree of increase in score on the general health questionnaire during the anticipation phase, greater in the Property Services Agency than in the other departments, although non-significant, is consistent in size with other studies examining anticipation of job change^{13 30-32}; it may be that unemployment, rather than anticipation of unemployment, is more likely to lead to psychological distress. The changes in reported physical health were larger for men, but changes in psychological health were larger for women—possibly because women tend to react to anticipation of job change with psychological symptoms and men with physical symptoms, albeit physical symptoms indicative of somatisation.³³

Overall the health related behaviour of the whole cohort changed little between the two time points. The few available data suggest that job insecurity has little effect on behaviour patterns that may damage health,³⁴ a phenomenon similar to that seen in the present investigation. The relative decline in health status of

Key messages

- Anticipation of job change has often been considered to have effects on health similar to actual unemployment, but few studies have gathered adequate prospective data on this topic
- Self reported health status measures for middle aged civil servants anticipating job change or job loss showed significant deterioration, relative to a group remaining in secure employment; this relative decline in health status could not be accounted for by changes in health related behaviours
- The consequences of such changes are relevant not only to the civil service but also to the privatisation of other public services and the rationalisation programmes being carried out in the private sector in Britain and elsewhere
- The increasing levels of job insecurity created by changes in the nature of employment relationships may lead to greater ill health in the general population, beyond the direct effects of unemployment

the Property Services Agency employees compared with those in other departments during the anticipation phase does not, therefore, seem to be due to changes in the health related behaviours measured. This result reflects recent findings that loss of employment is not associated with increased smoking or drinking⁴ or decreased physical activity³⁵ but is associated with increased mortality and morbidity, even after selection out of the workforce due to ill health is controlled for.⁴

Preliminary results from the in depth study of the Property Services Agency, started in 1994, indicate that the anticipation phase was experienced as a period of great stress and anxiety by most of the workforce. In an atmosphere where concrete information was scarce but rumour rife, the workforce had to adapt to new working practices which, in general, resulted in adverse changes to characteristics of the work environment and deteriorating relationships with management and between colleagues. This combination of factors was described by most employees in terms of adverse emotional responses, often accompanied by the onset of new health problems.

CONCLUSION

Among a group of white collar civil servants, anticipation of job change was associated with relative decline in self reported health status that was not accompanied by a relative worsening in the profile of health related behaviours. The application of a longitudinal design allowed the same people to be followed from job security into anticipation of job change or loss, and these results to confirm the evidence that such anticipation has an adverse effect on morbidity. More importantly, these data extend existing knowledge in this area by having controlled for health status before the anticipation phase.

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Bed sharing and the sudden infant death syndrome

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Abstract

Objective—To determine whether infants who died of the sudden infant death syndrome routinely shared their parents' bed more commonly than control infants.

Design—Case-control study.

Setting—Southern California.

Subjects—200 white, African-American, Latin American, and Asian infants who died and 200 living controls, matched by birth hospital, date of birth, sex, and race.

Main outcome measures—Routine bedding (for example, crib, cradle), day and night time sleeping arrangement (for example, alone or sharing a bed); for cases only, sleeping arrangement at death. Differences in bed sharing practices among races.

Results—Of the infants who died of the syndrome, 45 (22.4%) were sharing a bed. Daytime bed sharing was more common in African-American ($P < 0.001$) and Latin American families ($P < 0.001$) than in white families. The overall adjusted odds ratio for the syndrome and routine bed sharing in the daytime was 1.38 (95% confidence interval 0.59 to 3.22) and for night was 1.21 (0.59 to 2.48). These odds ratios were adjusted for routine sleep position, passive smoking, breast feeding, intercom use, infant birth weight, medical conditions at birth, and maternal age and education. There was no interaction between bed sharing and passive smoking or alcohol use by either parent.

Conclusions—Although there was a significant difference between bed sharing among African-American and Latin American parents compared with white parents, there was no significant relation between routine bed sharing and the sudden infant death syndrome.

Introduction

Reasons for bed sharing emerge from evolutionary, developmental, and cross cultural perspectives.¹ Parental sleep contact promotes sleep, breathing, and arousal patterns in infants,¹ and parents and infants who sleep together exhibit synchronous arousals^{1,2} and coordination of sleep stages.^{2,3} The composition of human milk also supports bed sharing; its low energy value causes infants to feed on demand throughout the day and night.²

Despite its reported benefits, bed sharing has also been linked to an increased risk of the sudden infant death syndrome. Mitchell *et al* ascribed such deaths to sleeping with adults, which may overheat infants.⁴ A case-control study in England found that bed sharing was more common in cases than controls.⁵ A nationwide case-control study in New Zealand found a twofold increase in the risk of the sudden infant death syndrome associated with sharing a bed⁶; further analyses by Scragg *et al*, however, found that bed sharing before death was a risk factor only among Maori infants.⁷ There was an interaction between bed sharing and maternal smoking on an additive scale (odds ratio=5.94). A postal survey of 197 infants in southern Australia suggested that a parent's alcohol consumption the night before the death may be a cofactor with bed sharing.⁸ A study of 92 cases and 100 controls in the District of Columbia found a threefold excess rate over the general population for bed sharing and the risk of the sudden infant death syndrome.⁹ The authors surmised this was due to asphyxia from overlaying, possibly combined with parental consumption of alcohol or drugs.⁹ A survey of Asian and white mothers by Farouqi *et al* did not support the hypothesis that bed sharing increased the risk of the sudden infant death syndrome.¹⁰ Asian infants were more

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