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The effect of job strain on British general practitioners' mental health

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Abstract

Questionnaires assessing mental health, job satisfaction, psychological job demands and job control were distributed randomly to 1000 GPs and 400 white-collar workers in the North of England. First, levels of mental health and job satisfaction were compared between the groups. GPs were significantly more depressed and less satisfied with their job compared to the white-collar sample. Surprisingly, female GPs experienced similar levels of poor mental health and job dissatisfaction as their male counterparts. Secondly, GPs were classified according to Karasek's (1979) job strain model as 'high strain' GPs (defined as high demands & low job control), 'active' GPs (high demands & high control), 'passive' GPs (low demands & low control) and 'low strain' GPs (low demands & high control). As hypothesised, 'high strain' GPs exhibited significantly greater levels of job dissatisfaction and depressive symptoms (e.g. suicidal ideation, loss of sexual interest, feeling hopeless about the future) than all other groups, with 38% scoring equal to or above the threshold for potential clinical depression. These findings are considered within the job strain paradigm and the implications for patient care and future interventions are discussed.

Introduction

Changes in the organisation and the management of health care provision in the UK, coupled with the nature of medical practice, may have increased the experience of occupational stress by general practitioners (GPs) and doctors (Caplan, 1994; Rout *et al.*, 1996; Sutherland & Cooper, 1993). Elevated levels of occupational stress may also have contributed to the increased prevalence of depression, anxiety and cardiovascular disease in health professionals (BMA, 1992; 1993; Chambers & Belcher, 1994; Firth-Cozens, 1998). The last decade has witnessed the most radical changes in the recent history of general practice, and has brought a significant increase in job demands and patient

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expectations (Cooper *et al.*, 1989; Sutherland & Cooper, 1992; 1993; Swanson *et al.*, 1996). As a result, GPs have been faced with the strain of attempting to balance, and meet the demands associated with their new role. The consequences of which may be far reaching, not only for the GPs themselves, but also for the patients within their care (Firth-Cozens, 1998; Firth-Cozens, 1993). In addition, GPs have experienced high levels of autonomy and control over their work in the past. However, there are indications that this may have been eroded as a result of the changes in the structure of the NHS. This may also be an important contributory factor to the experience of high levels of occupational stress and associated psychiatric morbidity (Rout *et al.*, 1996; Sutherland & Cooper, 1993).

Previous research

The issue of stress in general practice has been addressed extensively in the last number of years (e.g. Appleton *et al.*, 1998; Caplan, 1994; Chambers *et al.*, 1996; Cooper *et al.*, 1989; Firth-Cozens, 1998; 1997; Kirwan & Armstrong, 1995; Myerson, 1992; Rout *et al.*, 1996; Sutherland & Cooper, 1992; 1993; Swanson *et al.*, 1996; White *et al.*, 1997), the bulk of which has concentrated on identifying occupational stressors and highlighting factors which are predictive of poor psychological wellbeing. For example, Rout *et al.* (1996) found practice administration and demands of the job, interference with family life and social life, routine medical work, interruptions and working environment to be predictive of job dissatisfaction and negative mental wellbeing. Similarly, Sutherland & Cooper (1993) found eight factors to be associated with negative manifestations of stress, with the most important being pressure related to demands of the job and patients' expectations. Another study identified high levels of anxiety and stress to be predictive of depression, with one or more nights on-call per week, stress and depression predicting anxiety levels (Chambers & Belcher, 1994).

Several studies have investigated the severity of the problem and uncovered an alarmingly high level of mental ill-health and job dissatisfaction within the profession (Caplan, 1994; Sutherland & Cooper, 1992; White *et al.*, 1997). One study found GPs to be significantly more depressed compared to senior NHS managers, with 27% of GPs scoring as 'borderline' or 'definitely likely' to be depressed. They were also found to be more likely to report suicidal ideation compared to hospital consultants and NHS managers (Caplan, 1994). Others identified male GPs to be an 'at risk group', as they were found to experience the greatest levels of occupational stress and the least job satisfaction (McKevitt *et al.*, 1997; Swanson *et al.*, 1996). Moreover, Firth-Cozens (1998) recently suggested that stress related depression in GPs was part of a negative feedback system and may be associated with lack of sleep and making clinical mistakes.

However, there is a dearth of studies that have included a control or a comparison group. The most frequently cited studies (Chambers *et al.*, 1996; Cooper *et al.*, 1989; Rout *et al.*, 1996; Sutherland & Cooper, 1992) have only concentrated on GPs shortly after the changes were implemented, they have also failed to allow sufficient time to elapse in order that responses can manifest themselves and have neglected to incorporate a measure of job control or a broader occupational stress model. Therefore, this study sets out to assess levels of mental health in GPs well after the changes in the NHS have

been implemented and to include a comparable white-collar sample in order to control for socio-economic status and education level.

Control in the workplace

In 1979, Karasek presented one of the most significant occupational stress models in recent times. It incorporates control as a major component in the stress process. The basic axiom of the model being that psychological strain and physical-ill health can be predicted from the synergistic combination of job demands and job control (or decision latitude). He proposed two fundamental mechanisms underlying the model; the psychological strain and the active learning mechanisms. The former is characterised by the experience of high job demands with simultaneous low levels of latitude over decision-making. This mechanism has been found to be associated with high psychological strain and physical illness and has been identified as a potential independent risk factor in the development of cardiovascular disease (e.g. Dwyer & Ganster, 1991; Fox *et al.*, 1993; Karasek *et al.*, 1981; Parkes *et al.*, 1994; Schnall & Landsbergis, 1994; Theorell & Karasek, 1996; Theorell, 1996). The latter is characterised by the experience of high job demands and low levels of decision latitude and is said to promote the development of new behaviour patterns.

Karasek (1979) posited that 'an important potential implication of the model is that the mental strain consequences of high organisational output levels may be contingent on the flexibility and equity of the organisational decision structure' (p. 288). This may be particularly pertinent to general practice as it is hypothesised that mental ill-health is contingent on the cognitively appraised level of job control. Indeed Porter *et al.* (1987) argued that Karasek's concept of job decision latitude is an important concept to apply to general practice. To observers, GPs may appear to experience high decision latitude (e.g. skill variety, high levels of responsibility and high personal freedom) compared to other members of the primary health care team. However, in reality they may not perceive themselves as having such latitude, but rather as having little control. Therefore, this research departs slightly from the more traditional application of this model, that is, the epidemiological, occupation-level studies and considers it at an individual level of analysis.

Several major criticisms have been levelled against this model. First, the adequacy of the job decision latitude index as a measure of worker control was questioned. It was suggested the construct was too vague and all encompassing to be useful (Ganster, 1989a; Soderfeldt *et al.*, 1996). Second, Ganster & Fusilier (1989) maintained that the job decision latitude dimension was measuring a construct similar to skill level or general job complexity (and as a result a conceptually clearer measure corresponding to a range of workplace aspects was developed (see Ganster, 1989a)). Further, it was advocated that the model was confounded with socio-economic status, and the statistical appropriateness of the proposed interaction term was disputed.

Therefore, this study considered the role of the job strain model (in light of the criticisms outlined above) in predicting mental health (depression, anxiety, somatisation and job dissatisfaction) in male and female GPs in the North of England and places their levels of mental health within the context of other white-collar professionals. By doing this, allowing the seriousness of the problem to be

assessed and placed into a larger occupational context. As a result, providing a sound, empirical model to guide the planning and implementation of interventions.

Method

Procedure

One thousand GPs and 400 white-collar professionals were asked to respond to a questionnaire. The questionnaire pack included a covering letter explaining the nature of the survey. The pack was distributed between January and June 1997. Non-responders were sent a reminder letter one month after the initial mailing.

GP Sample

GPs were systematically selected from the Health Authority's medical lists by calculating a sampling interval (n=6) as suggested by Cartwright (1989). The sample was stratified to include 500 fundholding GPs and 500 non-fundholding. In this way it was possible to obtain responses which were representative of the changing nature of general practice and to achieve a suitable level of statistical power. A systematic method of random sampling was utilised in this study as it is an easier and more appropriate procedure to employ when obtaining a sample from a large data set (such as a Health Authority's medical lists).

White-collar professionals sample

White-collar professionals were systematically selected (by calculating a sampling interval (n=4)) from numerous business directories, listing a range of white-collar professions (accountancy, architecture, chiropody, dentistry, law, quantity surveying, optometry). The sample included 400 males and females from these comparable professions.

Questionnaire measures – GP Sample

Psychological job demands

Psychological job demands were measured by using a sub-dimension of Karasek *et al.*'s (1985) Job Content Survey. This dimension consists of nine items scored on a 4-point Likert scale. The reliability and validity of the measure are available elsewhere (Karasek *et al.*, 1985). Internal reliability for this scale with the current sample was α=0.81.

Job control

Job control was measured using an amended version of Ganster's (1989a) Control Scale, consisting of 20 Likert-scaled items (5-point scale). Two items on Ganster's (1989a) scale were deemed to be inappropriate to the population. Scores on the items were averaged to provide an aggregate index of the amount of control GPs perceived they had over their job, a high score indicates greater perceived control. Reliability and validity data is reported by Ganster (1989a). Internal reliability for this scale with this sample was α=0.85. Karasek's own measure of job decision latitude was not employed as it has been criticised (as previously mentioned) and replaced with this conceptually clearer measure.

Job strain

Over the last 15 years, research into the effects of job strain have adopted various different methods of operationalising the independent variable, job strain. Karasek (1979) originally employed regression analysis inputting the interaction between job demands and job decision latitude last in the analysis. Various researchers (e.g. Ganster & Fusilier, 1989; Hellerstedt & Jeffery, 1997; Kasl, 1989) have questioned the statistical appropriateness of the proposed interaction effect.

Ganster & Fusilier (1989) noted that his analysis rejected the traditional tests for interactions based on partialled product terms in regression analyses (as suggested by Cohen & Cohen, 1983). Theorell *et al.* (1988) utilised job strain as a continuous variable, computed as the ratio between psychological job demands and job control (by means of dividing job demands scores by job control scores) where a high strain score indicates simultaneously high psychological demands and low job control. Others have employed a multiplicative interaction term and found moderate support for the demands-control model. Some have utilised cut-off points above and below the median for demands and control to classify employees as 'high strain', 'low strain', 'active' and 'passive' and carried out one-way analysis of covariance (ANCOVA) to test the effect of job strain on various measures of psychological distress and predictors of cardiovascular disease (Blumenthal *et al.*, 1995; Schnall *et al.*, 1992; Schnall *et al.*, 1990; Van Egeren, 1992).

This present study uses a method which is similar to that described above and by others (Blumenthal *et al.*, 1995; Schnall *et al.*, 1992) where the job strain variable is categorised into high strain (high demands & low control), active (high demands & high control), passive (low demands & low control) and low strain (low demands & high control) groups. To create this variable, high and low latitude and demands were defined by median cut-off points on the job control and job demands scales.

Job satisfaction

Job satisfaction was assessed using 10 items from the Warr *et al.* (1979) job satisfaction scale. Items deemed inappropriate were excluded (Cooper *et al.*, 1989). Each item is scored on a 7-point scale (high score = high satisfaction). Items included statements about the satisfaction with hours of work, rate of pay, opportunities to use one's abilities. Reliability and validity data is reported by Warr *et al.* (1979). Internal reliability for this scale with the present sample was α=0.83.

Anxiety

Anxiety was assessed using the anxiety dimension from the Symptom Checklist 90-R (SCL-90-R, Derogatis *et al.*, 1973). Each item is scored on a 5-point scale (high score = high levels of anxiety). Items included asked how bothered or distressed one was by 'nervousness or shakiness inside, trembling, being suddenly scared for no reason, etc'. Reliability and validity data is reported by Derogatis *et al.* (1973). Internal reliability for this scale with this sample was α=0.91

Depression

Depression was assessed using the depression dimension from the Symptom Checklist 90-R (SCL-90-R, Derogatis *et al.*, 1973). Each item is scored on a 5-point scale (high score = high levels of depression). Items included, asked how bothered or distressed one was by 'thoughts of ending your life, feeling trapped or caught, feeling hopeless about the future, etc'. Reliability and validity data is reported by Derogatis *et al.* (1973). Internal reliability for this scale with this sample was α=0.93.

Somatisation

Somatisation was assessed using the somatisation dimension from the Symptom Checklist 90-R (SCL-90-R, Derogatis *et al.*, 1973). Each item is scored on a 5-point scale (high score = high levels of depression). Items included asked how bothered or distressed one was by 'headaches, pains in chest or heart, nausea or upset stomach, etc'. Reliability and validity data is reported by Derogatis *et al.* (1973). Internal reliability for this scale with this sample was α=0.88.

Questionnaire measures – white-collar professionals sample

The questionnaire pack distributed to the white-collar professionals comprised measures of job satisfaction, depression, anxiety and somatisation. Demographic details were also collected.

Statistical analysis

Conventional statistical tests were used, including one-way analysis of variance (ANOVA) with Scheffe's *post hoc* test for multiple comparisons and independent samples *t*-tests were conducted to test GP, white-collar professional and gender difference comparisons.

Two-way ANOVA

GPs were classified into four groups, high strain, active, passive and low strain (job strain group) based upon median cut-off points on the job control and job demands scales. Analysis of variance was performed with gender and job strain group as the explanatory variables and each one of the four mental health variables as dependent variables. Scheffe *post hoc* multiple comparisons were performed in order to locate significant differences. The fundholding factor was not entered into the ANOVA as preliminary analysis revealed no significant differences between the groups. Age was not entered into any analyses as preliminary correlational analysis revealed no significant associations with any of the dependent variables.

Results

Response rates – GP sample

Four hundred and twenty-two questionnaires were returned giving a response rate of 42%. This is comparable with other questionnaire surveys in general practice (e.g. Cooper *et al.*, 1989) and considered above average in relation to other postal survey studies (Kasl & Cooper, 1987). GP ages ranged from 28 to 67 years (mean = 41.60 years, SD = 8.12 years). Male GPs ages ranged from 28 to 67 years (mean = 42.41, SD = 8.15) and female GPs ages ranged from 28 to 66 years (mean = 39.46, SD = 7.69). Female GPs were found to be statistically significantly younger than male GPs (t = 3.36, p < 0.001, 95% confidence interval 1.22 to 4.68). Three hundred and six (73%) GPs were male, 116 (27%) female. This is representative of general practice as a whole and comparable to the 26.7% of female GPs in England and Wales reported by Allen (1991). Two hundred and fifteen (51%) GPs were fundholding and 207 (49%) were non-fundholding GPs. Two hundred and ninety-five (72%) GPs were based in urban locations and 115 (28%) GPs were based in rural locations (12 GPs failed to include location of practice).

Response rates – white-collar professionals sample

One hundred and seventy-three questionnaires were returned from a postal survey giving a response rate of 43%. The respondents consisted of 30 accountants (17% of the sample), 17 solicitors (10% of the sample), 23 architects (13% of the sample), 45 dentists (26% of the sample), 17 opticians (10% of the sample), 14 quantity surveyors (8% of the sample) and 27 chiropodists (16% of the sample). One hundred and twenty-eight (75%) respondents were male and 43 (25%) were female. Two respondents did not disclose their gender. Respondents' ages ranged from 23 to 69 years (mean=45.86 years, SD=10.56 years). Male respondents' ages ranged from 24 to 69 years (mean=46.39, SD=10.73) and female respondents' ages ranged from 23 to 63 years (mean=44.02, SD=10.12).

Mental health in GPs and a comparison with white-collar workers

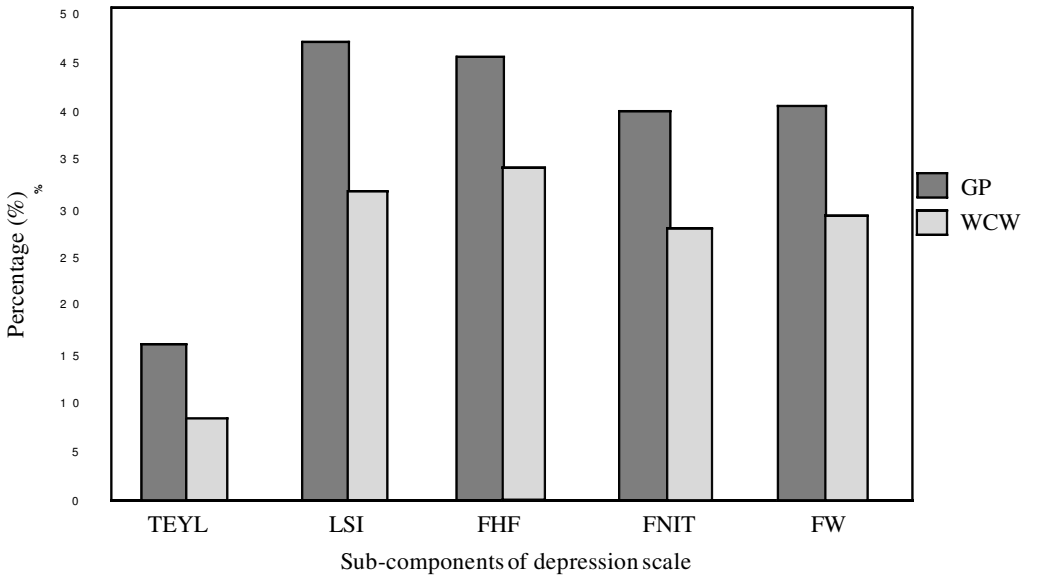
GPs were significantly more depressed than their white-collar counterparts (t=2.55, p=0.01, 95% confidence interval -0.04 to -0.32), with 91 GPs (22%) scoring equal to or above the threshold (1.5; one standard deviation below the mean of a clinical depressed patient sample) for potential depression on the SCL-D (Firth-Cozens, 1998) (Table 1). There were 15.6% of GPs who reported having 'some' suicidal ideation: 6.6% more than 'a little bit', compared to 8.1% and 2.3% respectively, in the white-collar workers (t=1.97, p=0.03, 95% confidence interval 0.08 to 0.24[1]). There were 46.7% of GPs who reported some loss of sexual interest or pleasure compared to 30.6% in the white-collar group (t=3.52, p<0.001, 95% confidence interval 0.16 to 0.57); 44.5% of GPs reported feeling hopeless about the future compared to 33.5% in white collar group (t=2.65, p=0.008, 95% confidence interval 0.07 to 0.49); 30.3% felt no interest in things compared to 27.7% (t=2.78, p=0.006, 95% confidence interval 0.07 to 0.42) and 40% of GPs felt worthless compared to 28.8% in the white collar group (t=3.10, p=0.002, 95% confidence interval 0.11 to 0.48) (Figure 1). However, there were no significant differences in anxiety (t=1.01, p= 0.31, 95% confidence interval –0.18 to 0.06) or somatisation (t=0.93, p=0.35, 95% confidence interval -0.05 to 0.14) between GPs and other white-collar workers (Table 1).

Table 1: Dependent variables: descriptive statistics for GP and white collar workers: depression, anxiety, somatisation sub-scales of SCL-90, (Derogatis, 1973) and Job Satisfaction Scale (Warr *et al.*, 1979).

	General practice+			White collar workers¶			*t*-value	95% CI
	N	Mean score	SD	*N*	Mean score	SD		
Satisfaction								
male	306	39.81	7.76	128	45.04	8.22		
female	116	40.72	7.82	43	47.24	7.89		
Total	422	40.06	7.78	171	45.58	8.19	7.59**	-4.02 to -6.83
Depression								
male	306	0.89	0.84	128	0.70	0.73		
female	116	0.88	0.76	43	0.70	0.64		
Total	422	0.89	0.82	171	0.71	0.70	2.55*	-0.04 to -0.32
Anxiety								
male	306	0.65	0.75	128	0.56	0.67		
female	116	0.58	0.66	43	0.52	0.52		
Total	422	0.63	0.73	171	0.56	0.64	1.01	-0.18 to 0.06
Somatisation								
male	306	0.41	0.57	128	0.40	0.47		
female	116	0.32	0.41	43	0.55	0.52		
Total	422	0.39	0.53	171	0.43	0.48	0.93	0.05 - 0.14

\+ No significant gender differences were found on any of the measures in the GP population;
¶ No significant gender differences were found on any of the measures in the white collar population; * p=0.01; ** p<0.001.

[1] t-tests based upon scores from a 5-point Likert scale for each item



¶ = GP group significantly different across all sub-components compared to WCW group ($p < 0.05$)

Key:
- TEYL Thoughts of ending your life
- LSI Loss of sexual interest or pleasure
- FHF Feeling hopeless about the future
- FNIT Feeling no interest in things
- FW Feeling worthless

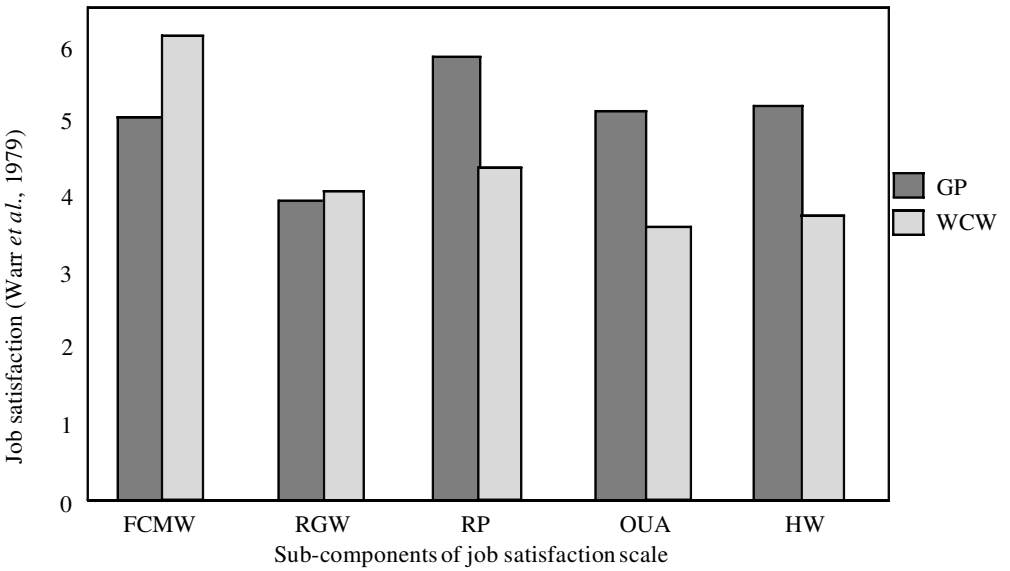
Figure 1: Distribution of depression symptoms causing 'a little' to 'extreme' distress across GPs and white collar workers (WCW)¶.

GPs were significantly less satisfied with their jobs compared with other white-collar workers (t=7.59, p<0.001, 95% confidence interval -4.02 to -6.83) (Table 1). They were particularly aggrieved with the hours they work (t=12.76, p<0.001, 95% confidence interval -1.49 to -2.03), the freedom they have to choose their own method of working (t=9.19, p<0.001, 95% confidence interval -0.82 to -1.26), recognition they receive for good work (t=6.38, p<0.001, 95% confidence interval -0.59 to -1.11), their rate of pay (t=5.37, p<0.001, 95% confidence interval -0.52 to -1.12) and opportunity to use their abilities (t=5.63, p<0.001, 95% confidence interval -0.50 to -1.01) see Figure 2.

Contrary to previous research, female GPs were not significantly less depressed (t=0.06, p=0.95, confidence interval -0.17 to 0.18) anxious (t=0.80, p=0.42, 95% confidence interval –0.09 to 0.22) and did not somatise less (t=1.66, p=0.10, 95% confidence interval –0.02 to 0.21) compared to male GPs. They also reported similar levels of job satisfaction (t=1.15, p=0.25, 95% confidence interval –0.79 to 3.01) (Table 1).

Differences in levels of mental health in job strain groups

Once the sample of GPs was categorised by median cut-off points on the job control and job demands scales there were 130 (31%) GPs classified as high strain (89 male, 41 female), 72 (17%) GPs as active (53 male, 19 female), 92 (22%) GPs as passive (64 male, 28 female) and 128 (30%) GPs as low strain



¶ = GP group significantly different across all sub-components compared to WCW ($p < 0.001$)

Key: FCMW Freedom to choose method of working
RGW Recognition for good work
RP Rate of pay
OUA Opportunity to use abilities
HW Hours of work.

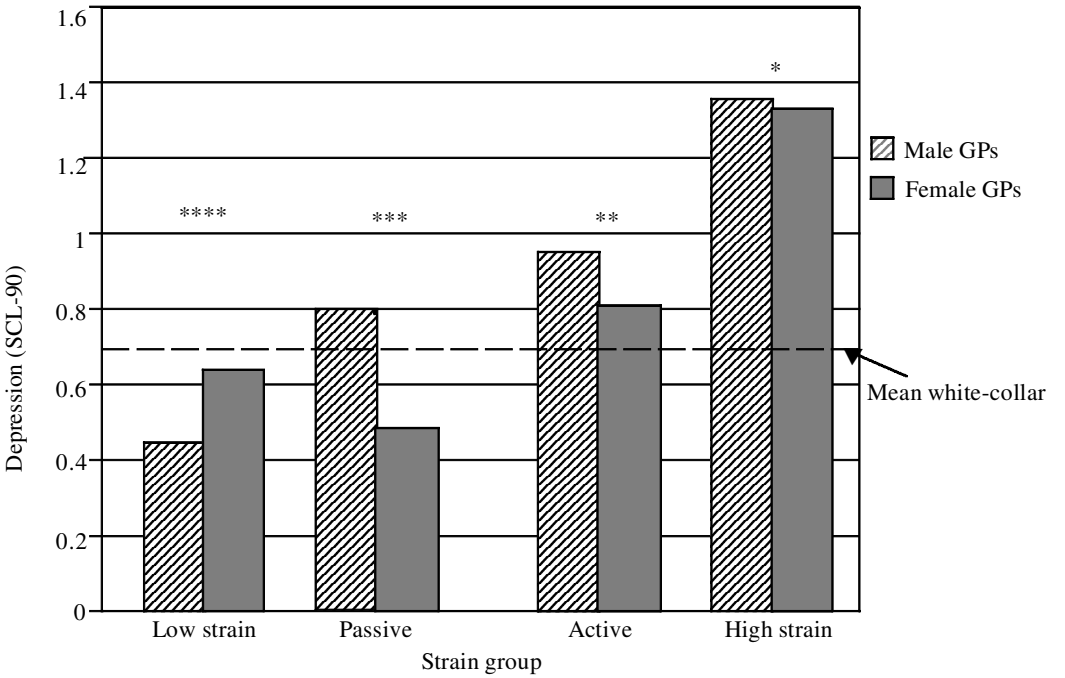
Figure 2: A comparison of job satisfaction scores across GPs and white-collar workers (WCW)¶.

(100 male, 28 female). No significant differences were observed for age between the groups (F (3, 416)=0.26, p=0.85).

A main effect for strain group (high strain, active, passive & low strain) was observed for depression levels (F (3, 414)=25.08, p<0.001). High strain GPs were significantly more depressed than all the other groups (Figure 3). There was no significant main effect for gender (F (1, 414)=0.96, p=0.33) or a significant interaction (F (3, 414)=1.60, p=0.19). The active GPs were significantly more depressed than the low strain, but not more so than the passive group. However, only the high strain GPs were significantly more depressed than the white-collar workers (F (4, 594)=27.32, p<0.001). More importantly, 49 (38%) of the high strain GPs scored equal to or above the threshold for potential depression (1.5) compared to 20 (22%) in the active, 11 (15%) in the passive and 13 (10%) in the low strain groups (see Figure 3).

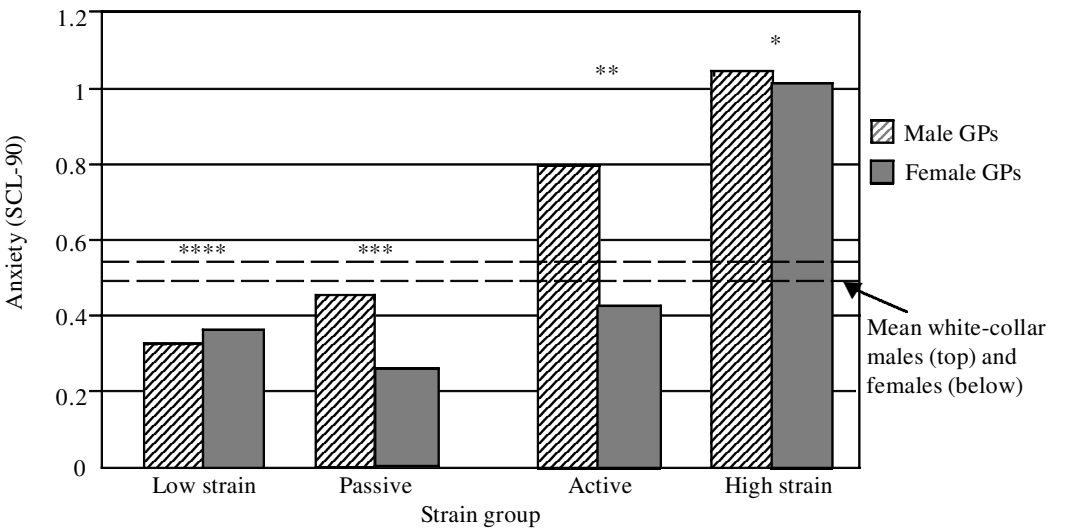
Similarly, a main effect for strain group was observed for anxiety levels (F (3, 414)=23.38, p<0.001). No main effect was found for gender (F (1, 414)=3.42, p=0.07) or an interaction (F (3, 414)=1.25, p=0.29). High strain and active GPs were both significantly more anxious than all other groups (Figure 4). Passive and low strain GPs did not significantly differ. Nevertheless, only the high strain GPs were significantly more anxious than the white-collar workers (F (4, 594)=22.37, p<0.001).

With regard to somatisation, a significant main effect was found for strain group (F (3, 414)=8.04, p<0.001), but not for gender (F (1, 414)=4.69, p=0.08) or an interaction (F (3, 414)=0.30, p=0.83). High strain GPs



¶ANOVA with Scheffe multiple comparisons were used to investigate group differences
* significantly different from all groups; ** significantly different from low and high strain groups;
*** significantly different from high strain; **** significantly different from active and high strain groups.

Figure 3: A comparison of depression levels by strain group¶.



¶ANOVA with Scheffe multiple comparisons were used to investigate group differences
* significantly different from all groups; ** significantly different from low and high strain groups;
*** significantly different from high strain; **** significantly different from active and high strain groups.

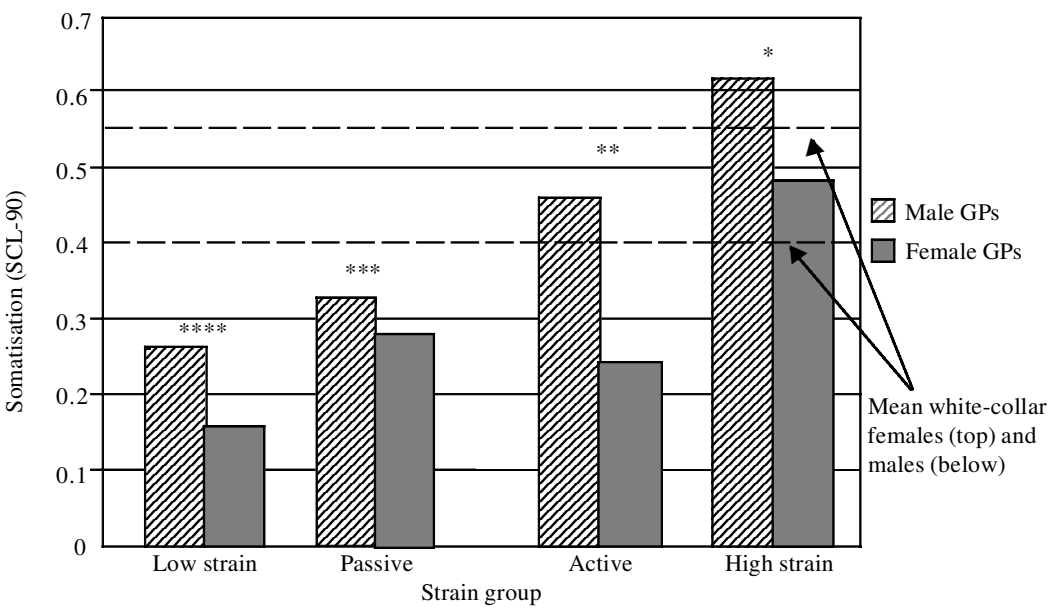
Figure 4: A comparison of anxiety levels by strain group¶.

were found to somatise significantly more than low strain and passive groups, but not active. No differences were observed between the active GPs and the other groups (Figure 5). Despite this, high strain GPs did not somatise significantly more than their white-collar counterparts, instead low strain GPs reported significantly lower levels (F (4, 594)=8.17, p=0.03).

Finally, a significant main effect was found for strain group (F (3, 414)=38.26, p<0.001) for levels of job satisfaction, but not for gender (F (1, 414)=5.90, p=0.10) or an interaction (F (3, 414)=0.24, p=0.87). High strain GPs were significantly less satisfied than all others, with low strain GPs also being significantly more satisfied than all other groups. Active and passive GPs did not differ significantly (Figure 6). However, all groups of GPs felt significantly less satisfied with their jobs except low strain GPs when compared with the other white collar workers (F (4, 594)=24.10, p<0.001). These are the lowest mean job satisfaction scores reported to date (Appleton *et al.*, 1998)

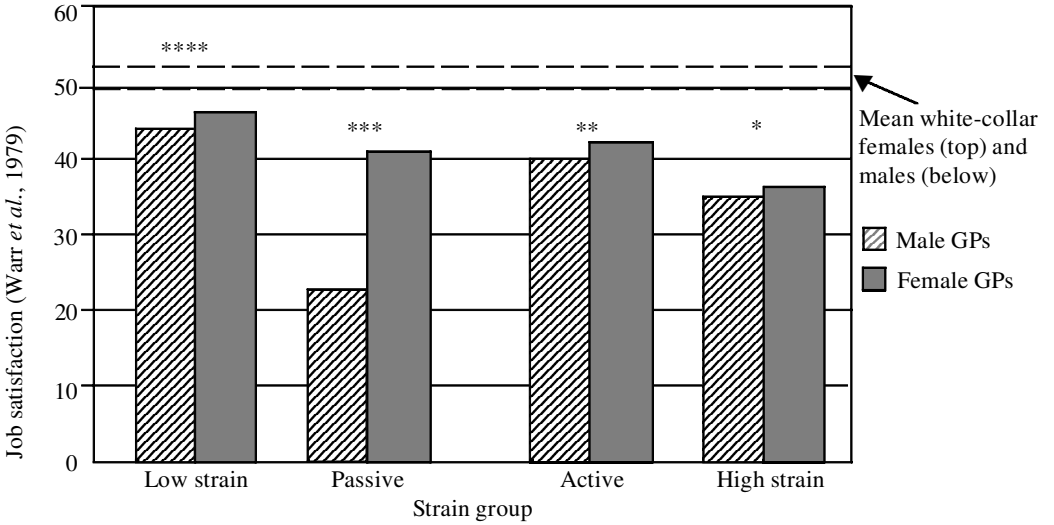
Discussion

These results are consistent with earlier findings and indicate that increasing levels of job strain are associated with elevated mental ill-health (e.g. Kristensen, 1995; Landsbergis, 1988; Theorell *et al.*, 1993), particularly with high levels of depression and job dissatisfaction in both male and female GPs. Further, it reveals that British GPs are significantly more depressed and less satisfied with their job than a representative sample of white-collar workers. In fact, 38% of the GPs in our sample scored equal to or above the threshold



¶ANOVA with Scheffe multiple comparisons were used to investigate group differences
* significantly different from low and passive groups; ** no significant difference between groups
*** significantly different from high strain group; **** significantly different from high strain group.

Figure 5: A comparison of somatisation levels by strain group¶.



¶ ANOVA with Scheffe multiple comparisons were used to investigate group differences

* significantly different from all groups; ** significantly different from high strain and low strain group
*** significantly different from high strain and low strain group; **** significantly different from all groups.

Figure 6: A comparison of job satisfaction levels by strain group¶.

for potential clinical depression. In addition, twice as many reported having some suicidal ideation compared to the white-collar group. They were also significantly more likely to report loss of sexual interest or pleasure, feeling hopeless about the future, feeling worthless and having no interest in things. These findings echo that of Caplan (1994) who found 14% of GPs surveyed in 1993 exhibited suicidal thinking. Hitherto, no previous study has revealed the extent of the depressive symptoms experienced by these GPs and their relative high frequency compared to other highly educated non-clinical workers. Clearly, this is an area for concern and needs to be addressed.

Surprisingly, on measures of anxiety and somatisation a similar trend was not evidenced, with no significant differences between male and female GPs or the white-collar sample. This is contrary to a recent study by Rout *et al.* (1996) who found anxiety levels in male GPs to be significantly greater than the norm and female GPs significantly below. It is possible this is due to employing an unrepresentative comparison sample in the latter study, which may be confounded with low socio-economic status. Nevertheless, when the GP sample was investigated more closely, high strain GPs were found to report significantly greater anxiety levels compared to the white-collar workers.

Another finding is that GPs were significantly less satisfied with their job compared to the white-collar sample. This is consistent with other studies (Appleton *et al.*, 1998; Cooper *et al.*, 1989; Sutherland & Cooper, 1992; Rout *et al.*, 1996) which have found GPs to be particularly dissatisfied with their hours of work, the recognition they receive for their work, freedom to choose method of working, rate of pay and their opportunities to use their abilities. However, disturbingly these findings confirm job satisfaction levels are at an all time low within general practice (Appleton *et al.*, 1998). Despite the introduc-

tion of various initiatives such as, primary care co-operatives and the more widespread use of deputising services, job satisfaction levels are still on the decline. Evidently, more has to be done to restore the morale within the profession.

Absence of gender differences

For the first time, this study has revealed no significant differences between male and female GPs on any of the mental health measures. This is not congruent with the majority of previous studies (e.g. Cooper *et al.*, 1989; Rout *et al.*, 1996; Sutherland & Cooper, 1992; Swanson *et al.*, 1996). Historically, male GPs have been identified as the group most at risk, with their female counterparts reportedly experiencing and suffering less as a result of occupational stress (Cooper *et al.*, 1989; Sutherland & Cooper, 1992). In the past, it has been suggested that, female GPs experience less negative manifestations of stress because they tend to work part-time, are less likely to be senior partners, work less on-call, and as a result these factors act as a buffering mechanism against the stress of the job (Firth-Cozens, 1998; White *et al.*, 1997). However, these results suggest the situation has changed. More female GPs are working full-time, becoming senior partners, working on-call and also maintaining the major responsibility for home and family life. Chambers *et al.* (1996) found that 66% of male GPs and only 2% of female GPs reported a partner would take care of a sick child and only 16% of men, compared to 75% of women GPs with children, said they had taken full responsibility for child-care arrangements. Similarly, White *et al.* (1997) found that external factors such as juggling home and work life as a significant predictor of depression in a sample of female GPs. Therefore as the number of females entering the medical profession continues to increase (over 50% entered medical school in 1995, Audit Commission) so too will the adverse impact of juggling the home–work interface. Distressingly, a large scale study of NHS trust staff found that female hospital doctors had the second highest rate of minor psychiatric disorder compared to all other NHS occupations (Wall *et al.* 1997). Are female GPs destined to become the new 'at risk' group?

Support for the job strain model

In this study, the findings were generally congruent with the two major predictions of the job strain model. First, individuals who report high psychological job demands whilst simultaneously experiencing low levels of job control (high strain) will suffer greater psychological strain than those who experience higher levels of job control. Secondly, individuals in active jobs (high demands & high job control) will not experience psychological strain, instead they may develop new behaviour patterns on and off the job. In this study, high strain GPs were found to be significantly more depressed, anxious and somatise more than all other groups of GPs (with the exception of active GPs for somatisation). They also reported levels of depression significantly greater than the comparison group of white-collar workers. More alarmingly, 38% of high strain GPs reported levels of depression equal to or above the threshold for potential clinical depression, compared to 22% in the active group. Also, the GPs in the active group did not significantly differ from the white-collar workers on their mean levels of depression, anxiety or somatisation. Thus suggesting an absence of psychological strain and support for job strain theory.

This study also addresses several of the major criticisms of the job strain model. A number of researchers have suggested that the model is less applicable for women and

has generally been used with male samples (e.g. Weidner *et al.*, 1997). The results presented here for female GPs are generally consistent with the hypotheses and predictions of the model suggesting the converse. However, the job strain levels for male GPs tended to explain more of the variability in their mental health than that of their female counterparts. This is likely to be because other gender specific factors were not accounted for in this study (e.g. demands of juggling home and work life).

It has also been suggested that the model is not predictive in homogeneous occupational groups and is confounded by low socio-economic status and educational level (Fox *et al.*, 1993; Ganster & Fusilier, 1989). Yet, when both these potential confounding variables are held constant, as in this study, job strain levels are able to discriminate between undetectable levels of depression and potential clinical depression.

Implications for patient care

Most disturbingly is the high level of depression reported by GPs in our sample and the resultant implications for patient care. Firth-Cozens (1998) has documented the relationship between stress, depression, sleep loss and making mistakes. Two points are relevant here. First, other studies have demonstrated that making mistakes is more of a problem in individuals who are highly stressed and high levels of depression are associated with greater sleep loss (Firth-Cozens, 1998). Second, in this study, those GPs experiencing the greatest job strain are also reporting the highest levels of depression. Therefore, suggesting a knock-on effect which may be associated with both continued mental ill-health in a significant number of GPs and an increased likelihood of clinical mistakes caused by lack of sleep and maladaptive coping strategies such as alcohol and substance abuse. In addition, the very low levels of job satisfaction have direct consequences for the quality of service for patients (Grol *et al.*, 1985). Plainly, steps must be taken to deal with this issue. Effective coping strategies should be incorporated into medical training, with particular regard to alcohol and substance misuse, policy changes to ensure more adequate sleep patterns, and medicated treatment of clinical depression (Firth-Cozens, 1998; O'Connor *et al.*, 1999).

Implications of job strain model for intervention

These findings have important consequences for what can be done about GPs' mental ill-health and low levels of job satisfaction. They imply that GPs would benefit if they had greater job control and autonomy. Also Sims (1997) argues that evidence-led interventions are the way forward in general practice. Therefore, in response to the evidence presented in this study, the planning and implementation of stress management should target levels of job control and autonomy at both an individual (practice) and an organisational (management) level. One method of doing this is to encourage participation in decision-making at both levels (Jackson, 1983). It has been suggested that the high level of mental ill-health experienced by GPs in the UK is a result of GPs feeling they had not been consulted about the changes imposed upon them and their work environment by the new contract (Rout *et al.*, 1996).

The benefits of participatory decision-making for British GPs are broadly two-fold. First, if GPs at an individual level are allowed/encouraged to participate in decisions relating to the structure and dynamics of their work environment they may be able to improve coping strategies (e.g. change appointment systems, improve time management,

utilise deputising services) which will help negate and alter their perceptions of work stressors. In this way, increased demands from patients (and others) will become more manageable. Second, at an organisational level, participatory management practices should be endorsed from the highest level and GPs should be provided the opportunity to partake, consult and influence the decision-making at managerial level. As a result, resistance to change is reduced, shared governance encouraged and ownership of the problem promoted. Studies have shown that in white-collar organisations such as primary care and others, that increased participation in decision-making in the job can help ameliorate occupational stress, offset psychological distress and reduce general health risk (Chappell, 1993; Jackson, 1983; Karasek, 1990).

This study focused upon the psychosocial risk factors for poor mental health such as job demands, job control, and their interaction in the form of job strain. Of course, it is probable, that personality also plays an important causal role in high levels of occupational stress and psychiatric morbidity among GPs. However, similar to Ramirez *et al.* (1996) personality was not assessed as it was our intention to concentrate on 'potentially remediable issues' (p. 727). Also, information about non-respondents was not collected, and possibly confounding factors should be borne in when interpreting the data. Nonetheless, it is likely the results of this survey are representative because of the stratified randomised sampling techniques utilised. And if anything, these findings are an underestimation of the true picture, as in other health related studies non-respondents were found to be less healthy (Vernon *et al.*, 1984).

Finally, all the data collected in this study was of a self report nature, and as a consequence is subject to potential demand characteristics contamination. While a number of GPs may have attempted to provide socially desirable responses, this distortion is likely to have been minimal as the research was conducted by an independent non-NHS affiliated body, confidentiality was assured and the measures were generally low in emotional-cognitive bias.

Future investigations need to employ more objective outcomes measures, in order to determine whether job strain has an impact upon the physiological wellbeing of GPs as well as their psychological well-being. Also, the role of personality variables must be examined more closely. However, most importantly is the requirement of researchers to implement longitudinal, evaluated, stress interventions based upon evidence-led approaches (Sims, 1997).

Conclusions

It is well documented that there are many causes of depression and job dissatisfaction in the literature. Nevertheless, this study indicates that the psychosocial work environment plays an important role in the development of unacceptably high levels of mental ill-health and job dissatisfaction in both male and female British GPs. These findings have serious implications for patient care and the well-being of our GPs. Therefore, future research and interventions should not fail to include job strain as a crucial mediating factor in the strain – mental health relationship in GPs.

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