A DISCUSSION OF THE MENTAL HEALTH OF PUBLIC SCHOOL TEACHERS

Dr. Gary W. Ballou
Central Washington University
400 E. University Way
Ellensburg, WA 98926
United States of America

Abstract

Mental Health of Teachers: Dr. Gary W. Ballou, Department of Education, Central Washington University – This study compared the likelihood of minor psychiatric disorders among teachers with civil servants. Using the General Health Questionnaire (GHQ-28), the study surveyed 403 teachers and 611 civil servants in a large city in Washington State (USA), with 59.6% of teachers and 62.0% of civil servants responding. Logistic regression analysis revealed that the proportion of teachers with MPD was greater than civil servants. The difference, however, was not statistically significant through multiple logistic regression analysis adjusted for potential confounders. Reduced job satisfaction and lack of leisure time were associated with an increase in MPD among teachers. Among civil servants, longer working hours, reduced life satisfaction, and physical illness were associated with an increase in MPD. Separate analysis for male and female teachers revealed that job dissatisfaction was associated with MPD only in female teachers.

Keywords: Mental health, teachers, minor psychiatric disorders

1. Introduction

It has been suggested that public school teachers are exposed to highly stressful situations which are related to psychological and psychiatric problems (1). Statistics have suggested that psychological and psychiatric problems have been of increasing concern; the occurrence of individuals taking sick leave due to psychiatric problems increased from 0.11% in 1997 to 0.39 in 2007 (2,3). Accounts of worsening mental health among teachers include students' misbehavior (4, 5). School surveys conducted of school students in recent years have revealed that the occurrence of those who refuse to go to school has nearly doubled in a period of ten years (0.17% in 1997 vs. 0.33% in 2007 for elementary school children; 1.24% in 1997 vs. 2.73% in 2007 for junior high school students) (6,7). Furthermore, in junior high schools, acts of violence by students directed at teachers and other students were found to have increased approximately four-fold over the period from 1997 to 2007 (6). Therefore, it is reasonable to assume that, under such circumstances, teachers may be placed in stressful situations.

In addition to this, work overload for teachers has been an area of concern in Japan (4, 8) as well as in the United States (5). In Japan, a policy to reduce teachers' workload took effect in April 2002. The curricula were rearranged to reduce teaching hours, and teachers have been strongly recommended to comply with a five-day a week system. However, Japanese teachers may have been required to prepare classes while abiding by revised teaching guidelines within the curricula. This requirement has added to the job demands made of Japanese teachers. Other work characteristics and psychosocial factors, such as job insecurity, effort-reward imbalances, job dissatisfaction, and compromised general health have been proposed as stressors for teachers (2, 9-12), as well as for civil servants (13-16), particularly female civil servants (13, 17). These studies suggest that factors that may worsen mental health status include occupation as well as many other factors including demographic factors.

Unfortunately, there is no quantitative data suggesting which factors contribute to improving the mental health of American teachers, nor have there been any prior studies that have directly compared the factors associated with mental health disturbances between teachers and workers in other occupations in the United States. In light of this, I felt it crucial to find the factors associated with psychological/psychiatric problems in public school teachers in the United States using an appropriate reference professional group.

1.1 Aims of the study

I compared the proportion of subjects with minor psychiatric disorders (MPD) as a proxy for mental health status among Washington public school teachers using a standardized measure, with that of civil servants as a referent group. I hypothesized that the proportion is higher in teachers than in civil servants. I also sought what factors, if any, would be specifically associated with MPD in teachers.

2. Method

2.1 Subjects

From February to March 2009, I conducted a survey of public school teachers in a city in Washington State. The city had a population of approximately 1,909,300 and had 51 elementary schools, 19 junior high schools, and 10 K-8 schools in the year 2008. As a comparison group of workers with another occupation, I enrolled civil servants who worked in the same city on the grounds that their social status and living standards were equivalent to those of teachers. The average wage per month for public school teachers was approximately $46,326 while that for civil servants was $47,995 (18).

I sent a questionnaire to each member of a targeted population of 403 public school teachers and 611 civil servants who were then requested to anonymously return their responses by mail. The response rate was 59.6% for the teachers (men: 124/205; women: 116/198) and 62.0% for the civil servants (men: 305/489; women: 74/122). There was no significant difference between the two groups in terms of response rates in either men ($\chi 2=0.05$, df=1, *p*=0.82). There was no significant difference between responders and non-responders in terms of age-band distribution either in teachers ($\chi 2=1.8$, df=3, *p*=0.61) or in civil servants ($\chi 2=1.2$, df=3, *p*=0.75). The civil servants of the city consisted of office workers (68%), fire fighters (14%), technical experts (8%), public health nurses (3%), and others (7%). The study protocol was approved by the city involved in the study and the Board of Education of the city involved in this project.

2.2 Mental health assessment

To identify mental health problems among the subjects, the questionnaire included the 28-item General Health Questionnaire (GHJQ-28), originally developed by Goldberg and colleagues (19). The total score ranges from 0 to 28 and higher scores represent poorer mental health. In accordance with the procedure applied in previous studies, I used a cut-off point of 6, and I defined those individuals with a score of 6 or more as having a minor psychiatric disorder (MPD) (19-21). The GHQ-28 is composed of four subscales (range for each: 0-7): somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression.

2.3 Demographic variables and factors that possibly increase the likelihood of having MPD in public school teachers and civil servants

The demographic variables examined were age, sex, and marital status. I also examined the following factors that may influence the occurrence of MPD: working hours, sickness leave (number of days during the last 6 months), physical illness, sleeping hours, time spent with family, and time spent of leisure activities. Three psychometric scales were also included in the questionnaire to assess job satisfaction, life satisfaction and problem-solving ability. The job and life satisfaction scales are composed of 15 questions each, with a seven-point Likert-type scoring system (1=extremely dissatisfied, 7=extremely satisfied). Both of the satisfaction scores range from 15 to 105, with higher scores indicating higher levels of satisfaction (22). Problem-solving ability was evaluated with the Problem-Solving Inventory (PSI) (23) to assess the personal problem-solving process. The PSI consists of 32 items with a six-point, Likert-type scoring system for each item (range: 32-192). Lower scores correspond to higher levels of ability to solve problems. The reliability coefficient (Cronbach's alpha) was 0.95 for GHQ-28, 0.91 for job satisfaction, 0.87 for life satisfaction, and 0.85 for PSI in this sample studied. I opted for these factors on the basis that: 1) they have been studied in the related literature, 2) they are occupation-related factors, and 3) changes in the scores can be expected to improve (or worsen) mental health.

2.4 Analysis

After comparing demographic variables and factors of interest between the two occupational groups, I then analyzed whether age as either a categorical or continuous variable was associated with PMD, since it was expected to function as a confounder or effect-modifier in the associations between MPD and the other variables of my interest.

A preliminary analysis revealed that there was no linear relationship between age as a continuous variable and the likelihood of having MPD; it showed an inverted U-shape. Therefore, I dealt with age as a categorical variable consisting of four age-bands (20 to 29 yr, 30 to 39 yr, 40 to 49 yr, and 50 yr and over); three dummy variables were entered into the logistic regression analyses as forced covariates. Likewise, sex was also treated as a potential confounder because more female than male subjects were likely to have MPD, as was indicated by my preliminary analysis.

Four of the continuous variables examined, i.e., working hours at office and at home, time spent with family and time spent for leisure, were dichotomized in the analyses because they revealed a non-linear relationship to MPD in the preliminary data inspection.

Along with the primary aim of this study, the proportion of MPD in each group was then compared using a logistic regression analysis adjusted for age, sex and all variables available. Therefore, I examined whether the factors of interest described above were associated with having MPD in each occupational group, separately.

To examine statistical associations between the factors of interest and the likelihood of having MPD in the subjects under investigation, I again employed logistic regression analyses to yield the odds ratios (Ors) in the two groups, separately, with a 95% confidence interval (CI), first in a model adjusted for age and sex. If an association was implied, i.e., the p-value was less than 0.25 (24), this variable was selected and entered into further analyses. The selected variables, age and sex were entered into a multivariable, full model for the groups of public school teachers and civil servants, respectively. I used SPSS version 11.5J for Windows (SPSS, Chicago), statistical software, and $p<0.05$ was considered statistically significant. In the comparison of a continuous variable between two groups, I used the Wilcoxon rank-sum test in anticipation of non-normal distributions. As for categorical variables, the chi-square test was applied.

3. Findings

3.1 Demographic variables

Table 1 shows the characteristics of the public school teachers and civil servants. There were significant differences between the teachers and civil servants in terms of age (mean=39.7 vs. 41.4 yr for teachers and civil servants, respectively; $p=0.02$) and sex (proportion of female subjects: 48.3% vs. 19.5%; $p<0.001$). The proportion of those with a marital status other than married did not differ between the groups ($p=0.27$). The score on the GHQ-28 was significantly higher among the teachers than among the civil servants (mean: 8.2 vs. 6.3 points; $p=<0.001$). Regarding the four subscales of the GHQ-28, teachers had significantly higher scores for the somatic symptoms ($p=0.001$) and anxiety and insomnia ($p=0.02$) subscales than civil servants. The other two subscales did not show any significant differences.

3.2 Proportion of subjects with MPD for public school teachers and civil servants

The proportion of subjects with MPD among public school teachers was significantly greater than that among civil servants (62.9% vs. 46.4%; $\chi2=16.01$, df=1, $p<0.001$). A logistic regression analysis with an adjustment for age and sex showed a significant association (OR=1.55; 95%CI: 1.09 to 2.20; referent category: civil servants). When age, sex and all the variables I collected were controlled for, the statistical significance no longer persisted (OR=1.15; 95%CI: 0.61 to 2.19).

3.3 Identification of variables that possibly increase the likelihood of having MPD

I analyzed each factor of interest with an adjustment for age and sex using logistic regression analyses for public school teachers and civil servants, respectively. In the teacher's group, the candidate factors possibly associated with MPD, i.e., the factors that showed a p-value of less than 0.25, included unmarried, longer working hours at home, shorter time spent with family, shorter time spent on leisure, lowered job satisfaction, lowered life satisfaction, lowered problem solving skill, presence of physical illness, sick leave, and decreased sleeping hours. These were entered into the multivariable, full model.

In the same analysis applied to civil servants, the candidate factors included longer working hours at the office, longer working hours at home, shorter time spent with family, shorter time spent on leisure, lowered job satisfaction, lowered life satisfaction, presence of physical illness, and sick leave. These variables, as well as age and sex, were selected and entered into another full model for the group of civil servants.

3.4 Determining factors that increase the likelihood of having MPD

Table 2 shows that, in the multivariable logistic regression analysis for the public school teachers, two variables remained statistically significant in the full model: lowered job satisfaction and shorter time spent of leisure.

For civil servants, the following variables remained statistically significant in the full model: longer working hours, lowered life satisfaction, shorter time spent on leisure, sick leave, and physical illness.

I repeated the same analyses conducted above for male and female subjects separately, for teachers and civil servants, respectively. For the male teachers, no variable remained statistically significant, whereas longer working hours (OR=2.23, 95%CI: 1.12 to 4.46), lowered life satisfaction (OR for 10-point decrease=1.38, 95%CI: 1.02 to 1.85), and history of sick leave (OR=1.92, 95%CI: 1.13 to 3.26) were all associated with MPD in male civil servants. In the female teacher group, lowered job satisfaction (OR for 10-point decrease=2.34, 95%CI: 1.23 to 4.46) was significantly associated with MPD, whereas lowered life satisfaction (OR for 10-point decrease=3.16, 95%CI: 1.05 to 9.56) and shorter time spent on leisure (OR=5.61, 95%CI: 1.07 to 29.5) were associated with MPD in female civil servants. Unexpectedly, shorter sleeping hours (OR=0.36, 95%CI: 0.13 to 0.97) were negatively associated with an increased likelihood of having MPD in female civil servants.

4. Discussion and Conclusion

To my knowledge, this is the first study focusing on occupational mental health problems in public school teachers with a reference group from another occupational group with a similar socioeconomic status. The proportion of those with MPD in Washington workers was shown to be high. My sample of teachers showed an extremely high rate of MPD (62.9%), conventionally defined as a score of 6 points or higher on the GHQ-28. This proportion was much higher than those in studies exploring teachers as ranged from 50.8% to 53.8% (25-27), and much higher than those of nurses (37.0%) and general office workers (25.2%) in a study conducted in the United States. However, the departure of my result from the findings of other studies should be interpreted cautiously, since non-respondent rates, the cut-off points for defining MPD, and the age distribution of the subjects has varied across studies.

I hypothesized that MPD may be more prevalent in public school teachers than in another occupational group, i.e., civil servants. However, there was no support for this hypothesis, since the likelihood of having MPD was not associated specifically with the group of school teachers after controlling for age, sex, and other covariates. As was expected, I found that the covariates I entered into the model exerted confounding effects, because the OR was reduced after controlling for the covariates. This implies that some of the covariates I collected other than age and sex may be more specifically associated with MPD in the teachers than they were in the civil servants.

In fact, I succeeded in finding variables associated with an increased likelihood of having MPD. However, the constellation of variables significantly associated with an increased likelihood of having MPD varied across the two occupational groups: job dissatisfaction and a shorter time spent on leisure among the teachers; longer working hours, lowered life satisfaction, a shorter time spent on leisure, sick leave, and the presence of physical illness among the civil servants (Table 2). It is fairly clear that in the group of civil servants, variables related to workload and physical illness are associated with an increased likelihood of having MPD. Studies have suggested that work characteristics such as high job demands, effort-reward imbalances, and chronic job insecurity have had an adverse effect on mental health among British civil servants (14-16). Both working overtime and overworking among male Washington workers are of grave concern (28-30). With respect to properties such as high job demands and overwork, my results for the civil servants accord particularly well with the literature.

With regards to public school teachers, a previous study showed that the occurrence of psychiatric morbidity was correlated with the strength of stress among elementary and secondary school teachers in south New York City (31). Another study reported that stress among teachers was associated with workload (4). Therefore, it could naturally be assumed that long working hours might be associated with MPD not only in the civil servants, but also in the teachers of the present study. Surprisingly, this was not confirmed for the teachers, even though they worked for significantly longer hours per week in the office (55.0 h) than the civil servants (42.5 h), much longer than the national averages in countries such as Japan (43.1 h), Hong Kong (46.6 h), and South Korea (47.5 h) (32).

The possible reasons for the non-significant association may be the inclusion of some teachers with MPD who cannot work long hours because of psychiatric morbidity and the exclusion of non-random missing information on subjects with MPD with long working hours; however, it remains possible that there is in fact no association between working hours and MPD among Washington teachers. If this is true, other work-related factors may be concerned. Job dissatisfaction was found to be associated with an increased likelihood of having MPD only in my sample of public school teachers. A study carried out in the UK suggested that increased job satisfaction protected the mental health of hospital consultants (33), as is consistent with my results. Despite the difference in the populations studies, studies have suggested that job satisfaction among specialist professionals, including teachers, lecturers, pharmacists, physicians, etc., is associated with the effectiveness of resolution strategies in professional settings; in other words, how well the subject functions as a specialist professional (10, 12, 33). Interestingly, Cockburn (10) indicated that preparing classes is one of the most effective resolution strategies for teachers and that increased job satisfaction in teachers was highly related to their readiness for teaching classes. If this is the case, job satisfaction may be a proxy measure in part for readiness for teaching, the reduction of which may be connected with the increased likelihood of having MPD.

It would seem that the promotion of job satisfaction, rather than decreasing working hours, is crucial for improving the mental health of Washington public school teachers. However, as was shown in the analyses conducted separately for male and female subjects, the association between decreased job satisfaction and the increased likelihood of having MPD was confirmed only in female teachers. One explanation is that this was a chance finding occurring only in female teachers, although other explanations can also be postulated, e.g., that Washington female teachers are less likely to increase readiness for teaching than male teachers. Of note is that in my sample, the number of working hours differed significantly for female and male teachers (per week: females 53.7 h, males 56.2 h: $z=2.4$, $p=0.02$), suggesting that female teachers may have limited time to prepare classes. This is in line with the fact that, according to statistics (34), the average hours spent attending to household affairs in women and men are quite different in the United States (hours per day in Japan: females 7.41h, males 0.48 h; in the US: females 6.21 h, males 3.26 h).

Interestingly, a shorter time spent on leisure activities may increase the likelihood of having MPD in both occupational groups. The association remained statistically significant only in female civil servants after stratification by sex. This implies that increasing the amount of time spent on leisure activities may be an effective strategy for improving mental health status among female civil servants. The emerged associations of the variables specifically related to MPD among the teachers, i.e., job dissatisfaction and limited leisure time, all point to a suggestion that poor mental health status among school teachers can be improved with particular care for female teachers. We should be aware, however, that we are not allowed to assume causation because of a cross-sectional design, which is a limitation of the present study. Whether increasing job satisfaction is an effective measure can only be confirmed in longitudinal studies, since job dissatisfaction can also be an effect that stems from MPD.

With regards to the limitations other than the cross-sectional design, I am aware that the selection of the study subjects may have been inappropriate in two ways. First, the selection of civil servants as control subjects in comparison with public school teachers may be inappropriate because, according to a prior study (17), mental health status among a group of civil servants was poorer than the normative data. Thus, I might have underestimated mental health issues among the teacher group. Second, in the separate analyses for the two groups of subjects, the estimates might have been biased due to possibly non-random missing information. Although the overall response rate in this study was comparable with that of similar types of other studies (35, 36), and the response rate did not differ between the two occupational groups, more subjects with MPD might have been excluded from the analyses because of missing information, leading the estimates to null values (37).

Since lowered socioeconomic status is an established risk factor for depression (38), I should have controlled for this factor as a potential confounder. In the present study, however, I learned from the official statistics that the mean annual income of the public school teachers and civil servants I examined were almost the same. Because all of the subjects are employed under the same regulations governing the state salary system, I assume that the socioeconomic status does not differ much across the subjects. Despite these limitations, Washington public school teachers were shown to suffer from poor mental health status as well as civil servants. Decreased job satisfaction and shorter time spent on leisure activities were factors associated with MPD among the teachers, especially the female teachers.

References

1. Pithers RT: Teacher stress research; problems and progress. Br J EducPsychol 65, 387-392 (1995)
2. Yaosaka O. The circumstances of teachers. In: Akao K, Arai A, Ito M, Sato H, Shimizu K. Fujita T, Yaosaka O, eds. A databook of educational statistics 2000-2001. Tokyo: Jijitsusinsha, 2000: 111-163 (in Japanese).
3. The Ministry of Education, Culture, Sports, Science and Technology. Report Announcement List. MEXT, 2005. (online), available from http://www.mext.go.jp/b_menu/houdou/17/12/05121602/011.htm, (accessed 2009-07-10).
4. Boyle GJ, Borg MG, Falzon JM and Baglioni AJ Jr.: A structural model of the dimensions of teacher stress. Br J EducPsychol 65, 49-67 (1995)
5. Hata M: Mental health of teachers. Education and Medicine 48, 644-650 (2000) (originally in Japanese)
6. Ito M. Students and life. In: Akao K, Arai A, Ito M, Sato H, Shimizu K, Fujita T, Yaosaka O, eds. A databook of educational statistics 2000-2001. Tokyo: Jijitsusinsha, 2000:69-109 (originally in Japanese)
7. The Ministry of Education, Culture, Sports, Science and Technology, School datum Survey. MEXT, 2004. (online), available from http://www.mext.go.jp/b_menu/toukei/001/04073001/001.htm, (accessed 2009-07-18).
8. Dussault M, Deaudelin C, Royer N and Loiselle J: Professional isolation and occupational stress in teachers. Psychol Rep 84, 943-946 (1999)
9. DeFrank RS and Stroup CA: Teacher stress and health: examination of a model. J Psychosom Res 33, 99-109 (1989)
10. Cockburn AD: Primary teachers' knowledge and acquisition of stress relieving strategies. Fr J EducPsychol 66, 399-410 (1996)
11. Griffith J, Steptoe A and Cropley M: An investigation of coping strategies associated with job stress in teachers. Br J EducPsychol 69, 517-531 (1999)
12. Miller GV and Travers CJ: Ethnicity and the experience of work: job stress and satisfaction of minority ethnic teachers in the UK. Int Rev Psychiatry 17, 317-327 (2005)
13. Nadaoka T, Kashiwakura M, Oiji A< Morioka Y and Totsuka S: Stress and psychiatric disorders in local government officials in Japan, in relation to their employment level. ActaPsychiatr Scan 96, 176-183 (1997)
14. Stansfeld SA, Fuhrer R and Shipley MJ: Types of social support as predictors of psychiatric morbidity in a cohort of British Civil Servants (Whitehall Study). Psychol Med 28, 881-892 (1998)
15. Stansfeld SA, Fuhrer R, Shipley JH and Marmot MG: Work characteristics predict psychiatric disorder: prospective results from the Whitehall II Study. Occup Environ Med 56, 302-307 (1999)
16. Ferrie JE, Shipley MJ, Stansfeld SA and Marmot MG: Effects of chronic job insecurity and change in job security on self reported health, minor psychiatric morbidity, physiological measures, and health related behaviors in British civil servants: the Whitehall II Study. J EdidemioComm Health 56, 450-454 (2002)
17. Sekine M, Chandola T, Martikainen P, McGeoghegan D, Marmot M and Kagamimori S: Explaining social inequalities in health by sleep: the Japanese civil servants study. J Public Health (Oxf) 28, 63-70 (2006)
18. The Ministry of Education, Culture, Sports, Science and Technology. The central council for education. MEXT, 2005 (online), available from http://www.mext.go.jp/b_menu/shingi/chuikyo/chukyo0/gijiroku/001/05120901/001-2.htm, (accessed 2009-04-25).
19. Goldberg DP and Hillier VF: A scaled version of the General Health Questionnaire. Psychol Med 9, 139-145 (1979)
20. Nakagawa Y, Daibo I. The Japanese Version; General Health Questionnaire. Tokyo: Nihon Bunka Kagakusha, 1985 (originally in Japanese)
21. Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O and Rutter C: The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med 27, 191-197 (1997).
22. Warr P, Cook J and Wall T: Scales for the measurement of some work attitudes and aspects of psychological well-being. J OccupPsychol 52, 129-148 (1979)
23. Heppner P and Petersen C: The development and implications of a personal problem-solving inventory. J Counsel Psychol 29, 66-75 (1982)
24. Hosmer DW, Lemeshow S. Applied Logistic Regression. New York: Wiley-Interscience, 1989.
25. Iida J, Oribe H, Hirose T and Ikawa G: Investigation of mental health of school teachers for the mentally retarded and staff members in social welfare facilities for the mentally retarded: using a Japanese version of the general health questionnaire (GHQ). Jpn J Psychiatry Neurol 48, 65-70 (1994)
26. Kanai Y, Kitazoe N and Inoue K: A study on mental health among junior high school teachers in relation to "Ibasyo". Jpn Bull SocPsychiat 14, 87-95 (2005) (originally in Japanese)

27. Kitazoe N and Inoue S: Mental health among teachers separated job experience years. PsychiatNerol Jap 106, 1662-1663 (2004) (originally in Japanese)

28. Takei N, Kawai M and Mori N: Sluggish economics affect health among Japanese 'business warriors'. Br J Psychiatry 176, 494-495 (2000)

29. Nakianishi N, Yoshida H, Nagano K, Kawashimo H, Nakamura K and Tatara K: Long working hours and risk for hypertension in Japanese male white collar workers. J EpidemiolComm Health 55, 316-322 (2001)

30. Liu Y and Tanaka H: Overtime work, insufficient sleep and risk of non-fatal acute myocardial infarction in Japanese men. Occup Environ Med 59, 447-451 (2000)

31. Cropley M, Steptoe A and Joekes K: Job strain and psychiatric morbidity. Psychol Med 29, 1411-1416 (1999)

32. International Labor Organization. LABORSTA Internet: Yearly Data. ILO, 2000. (online), available from http://www.laborsta.ilo.org, (accessed 2009-12-21).

33. Ramirez AJ, Graham J, Richards MA, Cull A and Gregory WM: Mental health of hospital consultants: the effects of stress and satisfaction at work. Lancet 347, 724-728 (1996)

34. The Ministry of Health, Labor and Welfare. White Paper on the Labor Economy 2006 (online), available from http://www.mhlw.go.jp/wp/hakusyo/kousei/06/dl/1-1.pdf, (accessed 2009-12-26) (originally in Japanese)

35. Benjamin S, Morris S, McBeth J, McFarlane GJ and Silman AJ: The association between chronic widespread pain and mental disorder. Arthritis Rheum 43, 561-567 (2000)

36. Steward R, Prince M, Richards M, Brayne C and Mann A: Stroke, vascular risk factors and depression. Br J Psychiatry 178, 23-28 (2001)

37. Rothman KJ and Greenland S: Modern Epidemiology, 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 1998.

38. Muntaner C, Eaton WW, Diala C, Kessler RC and Sorlie PD: Social class, assets, organization control and the prevalence of common groups of psychiatric disorders. SocSci Med 47, 2043-2053 (1998)

Table 1. Characteristics of Subjects and GHQ-28 Scores

	Teachers		Civil Servants		Comparison	
	N	% or SD*	N	% or SD*	Statistic	p-value
N of subjects	240		379			
Sex: female	116	48.3%	74	19.5%	χ^2=57.33, df=1	<0.001
Age (mean; median)	39.7; 39.0	SD 8.1	41.4; 42.0	SD10.1	z=2.42	0.02
Marital status; other than married	42	17.5%	80	21.1%	χ^2=1.21, df=1	0.27
GHQ-28 (mean; median)	8.2; 7.5	SD 5.8	6.3; 5.0	SD 5.6	z=4.32	<0.001
Subscales of GHQ-28$^\chi$						
Somatic symptoms (mean; median)	3.7; 4.0 SD 2.4		2.3; 2.0 SD 2.3		z=6.83	<0.001
Anxiety and insomnia (mean; median)	2.5; 2.0 SD 1.9		2.2; 2.0 SD 2.1		z=2.33	0.02
Social dysfunction (mean; median)	1.4; 1.0 SD 1.8		1.2; 1.0 SD 1.7		z=1.19	0.24
Severe depression (mean; median)	0.7; 0.0 SD 1.4		0.6; 0.0 SD 1.3		z=0.46	0.65

* Standard deviation.

Table 2. Variables That Increase Likelihood Of Having MPD*

Adjusted odds ratio(b)   p-value
Reference(95% confidence interval)

_____

	Adjusted odds ratio (95% CI)	p-value	Reference
TEACHERS			
Marital status	2.08 (0.51, 8.53)	0.31	Married
Unmarried			
Working hours at home per week	2.06 (0.65, 6.51)	0.22	0 h
1 + h			
Time spent with family per week	1.37 (0.67, 2.82)	0.39	≥21 g
<21 h			
Time spent on leisure per week	2.08 (1.02, 4.25)	0.04	≥5 h
<5 h			
Job satisfaction	1.45 (1.04, 2.03)	0.03	
For 10-pt decrease			
Life satisfaction	1.47 (0.98, 2.18)	0.06	
For 10-pt decrease			
Problem solving	1.17 (0.92, 1.49)	0.21	
For 10-pt increase			
Physical illness	1.65 (0.58, 4.69)	0.35	No
physical illness			
Present			
Sick leave during last 6 months	1.72 (0.77, 3.83)	0.18	No sick
leave			
1 + d			
Sleeping hours per day	1.20 (0.75, 1.92)	0.45	
For 1 - h decrease			
CIVIL SERVANTS			
Working hours at office per week	2.82 (1.43, 5.57)	0.003	≤45 h
>45 h			
Working hours at home per week	1.38 (0.72, 2.63)	0.33	0 h
1 + h			
Time spent with family per week	0.79 (0.47, 1.32)	0.36	≥21 h
<21 h			
Time spent on leisure per week	1.85 (1.07, 3.21)	0.03	≥5 h
<5 h			
Job satisfaction	1.12 (0.89, 1.42)	0.33	
For 10-pt decrease			
Life satisfaction	1.49 (1.13, 1.96)	0.005	
For 10-pt decrease			
Physical illness	1.91 (1.05, 3.45)	0.03	No
physical illness			
Present			
Sick leave during last 6 months	1.70 (1.05, 2.78)	0.03	No sick
leave			
1 + d			

a: Minor psychiatric disorder as measured by GHQ-28 score of six or more.
b: Adjusted for sex, age and all the variables with $p<0.25$ in the last analysis shown here.