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ORIGINAL ARTICLE

Minor mental disorders in Taiwanese healthcare workers and the associations with psychosocial work conditions

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Background/Purpose: Healthcare workers face multiple psychosocial work hazards intrinsic to their work, including heavy workloads and shift work. However, how contemporary adverse psychosocial work conditions, such as workplace justice and insecurity, may contribute to increased mental health risks has rarely been studied. This study aimed to search for modifiable psychosocial work factors associated with mental health disorders in Taiwanese healthcare workers.

Methods: A total of 349 healthcare workers were identified from 19,641 employees who participated in a national survey of Taiwan. Minor mental disorder was assessed using the five-item brief symptom rating scale. We compared psychosocial work characteristics and the prevalence of minor mental disorder in healthcare workers with that in a sociodemographically matched sample, and examined the associations of psychosocial work conditions with mental health status.

Results: Healthcare workers were found to have a higher prevalence of minor mental disorder than general workers, and they were more likely to have longer working hours, heavier psychological job demands, higher job control, more workplace violence, and a higher prevalence of shift work. Among healthcare workers, experiences of workplace violence, lower workplace justice, heavier psychological job demands, and job insecurity were associated with a higher risk for minor mental disorder, even after controlling for working hours and shift work.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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Conclusion: Despite the fact that healthcare workers work longer hours and shift work, there were several modifiable psychosocial work conditions that should be targeted to improve their mental health.

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Introduction

Healthcare workers are known to encounter multiple psychosocial work hazards, including heavy workload, long working hours, high psychological demands, workplace violence as well as a decline in professional job autonomy due to increasing managerial and cost control by healthcare organizations.^{1–3} These psychosocial work hazards have been shown to increase burnout and other health risks among healthcare workers,^{4,5} and also raise concerns of patient safety^{6,7} and work efficiency.^{8,9} Among all health issues, mental health requires particular attention because it is easily neglected. For example, previous studies indicated that physicians were at elevated risks for suicide and depression,^{10,11} but were less likely to seek professional help.^{12–14}

Healthcare workers used to work independently and enjoy high level of autonomy at work. However, recent studies showed that more and more physicians in the United States and in Taiwan are employed by hospitals.^{15,16} As employment of hospitals and healthcare organizations has accelerated, psychosocial work hazards in healthcare workers, including physicians, are expected to worsen. In addition, while healthcare workers in hospitals usually work as a team, mental health problems could be contagious, as suggested by social network studies.¹⁷

Furthermore, while mental health risks and their associated psychosocial work hazards among healthcare workers deserve attention, few studies have been conducted to examine to what extent their mental health status differs from the general working population, and if there are modifiable psychosocial work conditions which are associated with mental health. This study aimed to compare the prevalence of minor mental disorder and psychosocial work conditions in healthcare workers with that in sociodemographically matched employees, and to examine the associations of selected psychosocial work conditions with mental health status in healthcare workers.

Methods

Study participants and study design

The Ministry of Labor of Taiwan has conducted nationwide cross-sectional surveys with an interval of 3–5 years since 1988. These surveys were designed to assess multiple dimensions of work conditions and occupational safety and health issues in the general working population including employees, employers, and self-employed workers. Participants were selected through a two-stage random sampling

process. In the first stage, all districts and villages throughout Taiwan were grouped into strata according to their levels of urbanization. A random sample of districts and villages was chosen from each stratum. In the second stage, a random sample of households was selected within each district or village, and residents of the sampled households who were currently working at the time of the survey were identified. Self-administered questionnaires were delivered to the selected households by trained interviewers. Individuals were informed of the purpose of the survey and invited to participate in a face-to-face manner. After 1 week, completed questionnaires were collected, and on-site checking was performed by the same interviewer.

Data for this study was drawn from the survey conducted in September 2013. The survey engaged 14,114 men and 10,442 women; among them 10,390 male and 9251 female employees were included in the analysis. The overall response rate was 88.9%. Healthcare workers were identified based on occupational codes, which included physicians, dentists, nurses, pharmacists, occupational therapists, physical therapists, nutritionists, speech-language-hearing therapists, and veterinarians.

Measures for mental health

Mental health status was assessed by the five-item brief symptom rating scale (BSRS-5), which was derived from the 50 item brief symptom rating scale.¹⁸ It consists of five items comprising the dimensions of anxiety, depression, hostility, interpersonal sensitivity, and additional symptoms: (1) feeling tense or keyed-up; (2) feeling depressed or in a low mood; (3) feeling easily annoyed or irritated; (4) feeling inferior to others; and (5) having trouble falling asleep in the past week. The respondents were asked to rate each question on a Likert-type scale from 0, not at all; 1, a little bit; 2, moderately; 3, quite a bit; to 4, extremely.¹⁹ A sum score of six or above identifies minor mental disorder such as depression and anxiety disorders with good sensitivity and specificity.¹⁹

Measures for psychosocial work conditions

Psychosocial job demands and job control were assessed by the Chinese version of the Job Content Questionnaire based on the job strain model by Karasek and Theorell.²⁰ This model postulates that a combination of high demands and low control causes high job strain that leads to negative health outcomes. Five core items for the demands scale (work fast, hectic, excessive work, not enough time, and concentrate on job for long time) were included in the questionnaires. The job control scale consists of two

subcomponents: six items for the skill discretion subscale (learning new things, high level of skills, nonrepetitive work, creative work, various tasks, develop one's abilities) and three items for the decision authority subscale (allowed to make own decisions, freedom to make decision, opinions influential). All items mentioned above were listed as a statement with response recorded on a four point Likert scale ranging from one (strongly disagree) to four (strongly agree). Items stated oppositely were reversely coded. The mean scores were then calculated and standardized.

Workplace justice consists of: (1) distributive justice, which refers to the fairness or equality of reward systems; (2) procedural justice, which denotes justice in the decision-making process; (3) interpersonal justice, which refers to the justice of interpersonal relationship; and (4) informational justice, which focuses on the extent to which an employee is informed in a timely and truthful manner about major decisions.²¹ A seven item scale for the assessment of workplace justice (trust, information reliable, work arranged fairly, rewards arranged fairly, performance evaluated fairly, information during decision making process, respect) was used, which was modified from the original standard questionnaire and showed good psychometric properties that justify their use.²² The response was recorded on a four point Likert scale, ranging from one (strongly disagree) to four (strongly agree). Items stated oppositely were reversely coded and the mean scores were then calculated and standardized. Also included in this study was one item for job insecurity (my job is secure) and its response was coded dichotomously (agree/disagree). Study participants were also asked if they have experienced any of the following four types of workplace violence, namely, physical violence, verbal violence, psychological bullying, and sexual harassment over the past 12 months prior to the survey, and responses were dichotomized (yes/no).

Finally, participants were also asked to provide information regarding their job title, total working hours, and the status of shift work (fixed day shift vs. nonstandard shift including evening/night/rotating/irregular shift) within the week prior to the survey.

Statistical analysis

Since healthcare workers are expected to be more educated, younger, and more female-dominant than general workers, a matched comparison group was constructed by selecting four employees who were matched with each healthcare worker on age (< 25 years, 25–34 years, 35–44 years, 45–54 years, 55–65 years, and > 65 years), sex, and education attainment (secondary school, university, and higher). Descriptive analyses were performed to compare the percentage of minor mental disorder (BSRS > 5) of healthcare workers with that of the matched comparison group. Subscores of each of the five dimensions were dichotomized (yes/no) and the presence of symptoms of the five dimensions was compared between healthcare workers and matched employees. The differences were tested with Chi-square tests for categorical variables and the *t* test for continuous variables. The associations of psychosocial work conditions and the risk of minor mental disorder among healthcare workers were examined by multivariate logistic regression models. The scores of job control, job demands, and workplace justice were ranked and dichotomized into low and high. SAS 9.2 (SAS Institute, Cary, NC, USA) was used for all of the analyses.

Results

A total of 349 health workers were identified. The average age, gender, and educational level are listed in [Table 1](#). When comparing with the gender-, age- and education-

Table 1 Comparisons of demographic characteristics and work conditions in health workers and the matched group.

	Health workers (<i>n</i> = 349)	Matched group (<i>n</i> = 1396)	<i>p</i>
Age [y, mean (SD)]	36.27 (10.17)	36.39 (10.09)	0.8
Gender [women, <i>n</i> (%)]	269 (77.1)	1076 (77.1)	1
Education			1
Middle school, <i>n</i> (%)	140 (40.11)	560 (40.11)	
University or above, <i>n</i> (%)	209 (59.89)	836 (59.89)	
Work psychological demand score, mean (SD)	61.33 (16.08)	51.71 (13.90)	< 0.001
Job control score (missing = 3), mean (SD)	54.32 (12.32)	50.82 (13.54)	< 0.001
Workplace justice score (missing = 91), mean (SD)	59.52 (16.81)	59.64 (15.21)	0.90
Job insecurity (missing = 4), <i>n</i> (%)	91 (26.15)	688 (49.39)	< 0.001
Nonstandard shift (missing = 21), <i>n</i> (%)	218 (62.64)	261 (18.97)	< 0.001
Working hour (h/wk)			< 0.001
≤ 40, <i>n</i> (%)	162 (46.42)	853 (61.10)	
41–45, <i>n</i> (%)	35 (10.03)	130 (9.31)	
46–48, <i>n</i> (%)	85 (24.36)	234 (16.76)	
≥ 49, <i>n</i> (%)	67 (19.20)	179 (12.82)	
Any workplace violence, <i>n</i> (%)	87 (24.93)	151 (10.82)	< 0.001
2 Kinds of violence, <i>n</i> (%)	28 (8.02)	55 (3.94)	
3 Kinds of violence, <i>n</i> (%)	10 (2.87)	8 (0.57)	
4 Kinds of violence, <i>n</i> (%)	5 (1.43)	2 (0.14)	

matched employees, healthcare workers were found to have a significantly higher prevalence of minor mental disorder (22% vs. 17%, $p < 0.001$). The prevalence of four of the five mental symptoms reported by healthcare workers was significantly higher than general employees (Figure 1).

With regards to psychosocial work hazards, as shown in Table 1, healthcare workers were more likely to have longer working hours, nonstandard shifts, higher psychological demands, higher job control, and more workplace violence. Health workers experienced multiple kinds of workplace violence.

Findings of logistic regression analysis showed that lower workplace justice, job insecurity, and experience of workplace violence were significantly related with an increased risk for minor mental disorder in healthcare workers (Table 2).

Discussion

When compared with age-, sex-, and education-matched employees, healthcare workers were found to have a higher risk for minor mental disorder. In addition, findings of this study indicated that healthcare workers were more likely to experience long working hours, higher psychological job demands, more workplace violence, and more nonstandard work shifts.

Our findings of a greater mental health risk among healthcare workers were in concordance with findings of some previous studies, which showed that physicians and nurses had higher rates of suicide and self-rated mental health problems than the general population.^{10,23} A study in the UK also found that among physicians and dentists, mental health problems were the leading reasons for referrals to occupational health service.²⁴

The observation that healthcare workers suffered to a greater extent from poorer mental health can be explained in several ways. One may speculate that people with poor mental health are more likely to choose healthcare work. However, a study showed that the prevalence of mental illnesses in 1st year medical students was similar to that in

Table 2 Odds ratio (OR) and 95% confidence interval (CI) for poor mental health in health workers ($n = 347$).

	Health workers (no. of cases = 76)	
	OR	(95% CI)
Age	0.96	(0.93–1.00)
Sex (women vs. men)	2.90	(1.02–8.29)
Education (secondary school vs. university and above)	1.20	(0.64–2.25)
High work psychological demand (vs. low)	2.65	(1.06–6.61)
Low job control (vs. high)	0.61	(0.31–1.20)
Low workplace justice (vs. high)	3.20	(1.67–6.15)
Workplace violence (vs. no)	3.64	(1.94–6.84)
Job insecurity (vs. secure job)	2.38	(1.22–4.67)
Nonstandard shift (vs. standard shift)	1.29	(0.65–2.57)
Work hour (h/wk)		
≤ 40	1	
41–45	2.23	(0.87–5.72)
46–48	1.10	(0.53–2.30)
≥ 49	1.16	(0.48–2.80)

CI = confidence interval; OR = odds ratio.

other 1st year university students.²⁵ Other studies found that prevalence rates of medical students resembled that of the general population at the time they entered medical school, but had risen and persisted over time through medical training when they were exposed to workplace conditions.^{26,27} Some studies furthermore documented that the worsening of mental health in professional careers was more severe in women than in men.^{26,28} While women make up a substantial proportion of the healthcare labor force, nevertheless, findings of our study suggested that poor mental health status was not a result of unbalanced distributions with regards to gender, age, or educational attainment of healthcare workers.

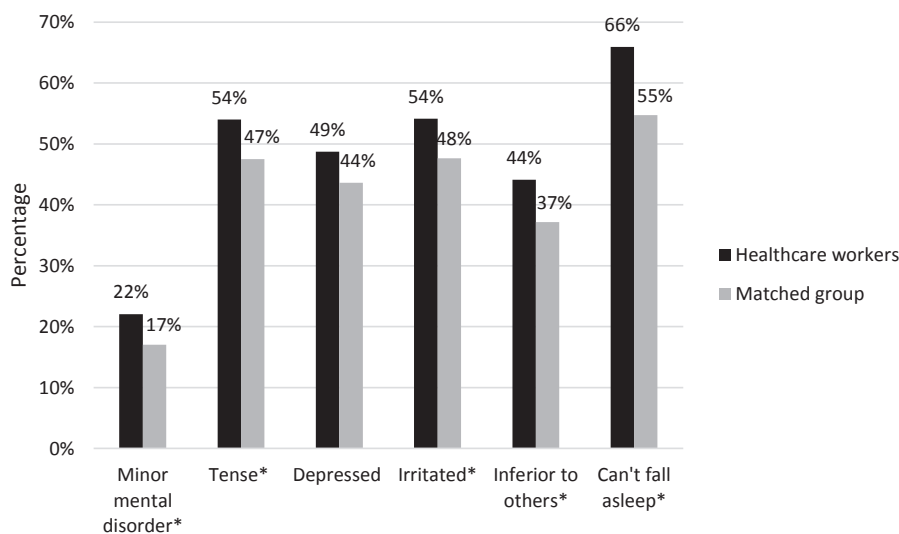


Figure 1 The percentage of minor mental disorder and symptoms of five-item brief symptom rating scale (BSRS-5) ($n = 349$ and 1396, respectively). * $p < 0.05$.

An alternative explanation is that the higher percentage of mental health disorder observed among healthcare workers is a consequence of discriminative employment policies. Studies from USA and the UK found that physicians with mental health problems were reluctant to seek professional help due to the concern of confidentiality and potential impacts on their privilege to practice medicine.²⁹ Some licensing boards even adopt discriminating policies against mentally ill physicians.¹³ In Taiwan, the Article 8-1 of the Physicians Act mandates practice license to be cancelled if a physician is found to be incapable of continuing his or her practice as a result of mental illnesses (available at: <http://law.moj.gov.tw/Eng/LawClass/LawAll.aspx?PCode=L0020001>). Such intimidating laws could deter physicians from seeking professional help for mental health problems. Medical students with depression also cited confidentiality issues and stigma associated with using mental health services as barriers to mental health treatment.^{14,30} A study using suicide registration data further suggested that undertreatment of mental illness in doctors is a major barrier for suicide prevention.³¹

While accumulating evidences have shown that adverse psychosocial work conditions lead to mental health problems in workers, it is imperative to examine working conditions of healthcare workers and explore how workers' mental health status may be affected by work. It is well known that long working hours and shift work were intrinsic to healthcare services, which are also the most studied psychosocial work hazards in healthcare workers.^{4,5} However, few studies controlled for other psychosocial work hazards when examining the relationship of working hour arrangements and stress-related health outcomes. In this study, we found that experience of workplace violence, lower workplace justice, job insecurity, and high psychological job demands were associated with poor mental health status in healthcare workers. In contrast, long working hours or shift work status *per se* were not significantly associated with poor mental health.

As employers of healthcare industries encounter intensifying cost containment plans adopted by health insurance agencies as well as increasing consumerism and competitive market conditions, management strategies aiming to reduce labor cost and to improve work efficiency have been widely adopted. Yet, few studies have examined psychosocial work conditions of healthcare workers and their associations with mental health status.

Previous studies have found that workers with lower workplace justice were more likely to have poor work performance, lower level of engagement, and also had higher risks for psychiatric illnesses.³² Findings of our study demonstrated that lower workplace justice was associated with mental health risks in healthcare workers. These results call for further investigations of inappropriate management policies or unbalanced employer-employee relationships in healthcare sectors.

Job insecurity, conceptualized as the perception of a threat to job continuity in employees, has been found to harm mental health in previous studies.³³ Although healthcare workers reported lower levels of job insecurities as compared to general employees, probably due to a shortage of healthcare workforce,³⁴ findings of the present study showed that job insecurity was significantly

associated with an increased risk for minor mental disorder in health workers. On the contrary, workplace violence has been quite prevalent in the healthcare sector. Our survey showed that one fourth of the healthcare workers experienced workplace violence in the past year and such an experience was strongly associated with an increased risk for minor mental disorder. Previous studies suggested that female healthcare workers were disproportionately affected by workplace violence as compared to their male counterparts.³⁵ In our study, age, gender, and educational level were controlled by matching, but healthcare workers were still at a higher risk for workplace violence. In previous studies, workplace violence was found to be associated with increased risks for psychological problems, including posttraumatic stress disorder, psychological distress, anxiety, sleep problems, and depression.^{36,37} On the one hand, some studies suggested that healthcare workers with higher levels of anxiety and depression were more likely to be victims of workplace violence.^{38,39} On the other hand, longitudinal studies confirmed that workplace violence and perceived job stress were predictive of future psychological problems.⁴⁰ Hence, the causal relationship between workplace violence and mental health problems could be bidirectional.

There are several limitations of this study. First, due to the broad classification of occupations, we could not distinguish subtypes of healthcare workers in this study. While sociodemographic characteristics and psychosocial work conditions differ substantially across types of healthcare workers, findings of this study were general, thus may not reflect specific occupations in the healthcare sector. Secondly, response rates of different types of healthcare workers were not available. Because physicians are more likely than other types of healthcare workers to refuse to participate in surveys, our study population may not reflect the true composition of healthcare workers. Thirdly, the cross-sectional nature of this survey precludes causal interpretation. Despite these limitations, findings of this study highlight the alarmingly high prevalence of mental health problems and the mental health risks of psychosocial work hazards in healthcare workers. It is particularly worth noticing that certain work characteristics, including experience of workplace violence, low workplace justice, and job insecurity were strongly associated with poor mental health among healthcare workers. While some intrinsic work characteristics in healthcare work such as shift work and heavy workloads had been documented to increase stress-related health risks, findings of our study further suggest that work characteristics on an organizational level such as poor management and low workplace justice could have deteriorating effects on psychosocial work conditions on an individual level, leading to increased mental health risks among healthcare workers. We suggest that when addressing mental health problems in healthcare workers, psychosocial work conditions on both the individual and the organizational levels should be considered. Furthermore, considering the high rate of minor mental disorder in healthcare workers, we also suggest that labor and health authorities should provide support, and at the same time should ensure confidentiality of affected workers in order to encourage them to seek mental health treatments.

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References

- Landon BE, Reschovsky J, Blumenthal D. Changes in career satisfaction among primary care and specialist physicians, 1997–2001. *JAMA* 2003;**289**:442–9.
- Gross R, Tabenkin H, Bramli-Greenberg S. Factors affecting primary care physicians' perceptions of health system reform in Israel: professional autonomy versus organizational affiliation. *Soc Sci Med* 2007;**64**:1450–62.
- Arnetz BB. Psychosocial challenges facing physicians of today. *Soc Sci Med* 2001;**52**:203–13.
- Wallace JE, Lemaire JB, Ghali WA. Physician wellness: a missing quality indicator. *Lancet* 2009;**374**:1714–21.
- Pisljar T, van der Lippe T, den Dulk L. Health among hospital employees in Europe: a cross-national study of the impact of work stress and work control. *Soc Sci Med* 2011;**72**:899–906.
- Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. *Soc Sci Med* 1997;**44**:1017–22.
- Dyrbye LN, Massie Jr FS, Eacker A, Harper W, Power D, Durning SJ, et al. Relationship between burnout and professional conduct and attitudes among US medical students. *JAMA* 2010;**304**:1173–80.
- Linzer M, Visser MR, Oort FJ, Smets EM, McMurray JE, de Haes HC, et al. Predicting and preventing physician burnout: results from the United States and the Netherlands. *Am J Med* 2001;**111**:170–5.
- Peterson U, Bergstrom G, Demerouti E, Gustavsson P, Asberg M, Nygren A. Burnout levels and self-rated health prospectively predict future long-term sickness absence: a study among female health professionals. *J Occup Environ Med* 2011;**53**:788–93.
- Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry* 2004;**161**:2295–302.
- Wang LJ, Chen CK, Hsu SC, Lee SY, Wang CS, Yeh WY. Active job, healthy job? Occupational stress and depression among hospital physicians in Taiwan. *Ind Health* 2011;**49**:173–84.
- Devi S. Doctors in distress. *Lancet* 2011;**377**:454–5.
- Center C, Davis M, Detre T, Ford DE, Hansbrough W, Hendin H, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA* 2003;**289**:3161–6.
- Givens JL, Tjia J. Depressed medical students' use of mental health services and barriers to use. *Acad Med* 2002;**77**:918–21.
- Cheng TM. Taiwan's new national health insurance program: genesis and experience so far. *Health Aff (Millwood)* 2003;**22**:61–76.
- Satiani B. Health care update: hospital employment or private practice? *Perspect Vasc Surg Endovasc Ther* 2013;**25**:46–52.
- Rosenquist JN, Fowler JH, Christakis NA. Social network determinants of depression. *Mol Psychiatry* 2011;**16**:273–81.
- Lee MB, Liao SC, Lee YJ, Wu CH, Tseng MC, Gau SF, et al. Development and verification of validity and reliability of a short screening instrument to identify psychiatric morbidity. *J Formos Med Assoc* 2003;**102**:687–94.
- Chen HC, Wu CH, Lee YJ, Liao SC, Lee MB. Validity of the five-item Brief Symptom Rating Scale among subjects admitted for general health screening. *J Formos Med Assoc* 2005;**104**:824–9.
- Karasek R, Theorell TR. *Healthy work: stress, productivity, and the reconstruction of working life*. New York: Basic Books; 1990.
- Moorman RH. Relationship between organizational justice and organizational citizenship behaviors: do fairness perceptions influence employee citizenship. *J Appl Psychol* 1991;**76**:845–55.
- Cheng Y, Huang HY, Li PR, Hsu JH. Employment insecurity, workplace justice and employees' burnout in Taiwanese employees: a validation study. *Int J Behav Med* 2011;**18**:391–401.
- Cohen JS, Patten S. Well-being in residency training: a survey examining resident physician satisfaction both within and outside of residency training and mental health in Alberta. *BMC Med Educ* 2005;**5**:21.
- Lalloo D, Ghafur I, Macdonald EB. Doctor and dentist contacts with an NHS occupational health service. *Occup Med (Lond)* 2013;**63**:291–3.
- Carson AJ, Dias S, Johnston A, McLoughlin MA, O'Connor M, Robinson BL, et al. Mental health in medical students. A case control study using the 60 item General Health Questionnaire. *Scott Med J* 2000;**45**:115–6.
- Rosal MC, Ockene IS, Ockene JK, Barrett SV, Ma Y, Hebert JR. A longitudinal study of students' depression at one medical school. *Acad Med* 1997;**72**:542–6.
- Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Acad Med* 2014;**89**:443–51.
- Goebert D, Thompson D, Takeshita J, Beach C, Bryson P, Ephgrave K, et al. Depressive symptoms in medical students and residents: a multischool study. *Acad Med* 2009;**84**:236–41.
- Hassan TM, Ahmed SO, White AC, Galbraith N. A postal survey of doctors' attitudes to becoming mentally ill. *Clin Med* 2009;**9**:327–32.
- Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. *JAMA* 2010;**304**:1181–90.
- Gold KJ, Sen A, Schwenk TL. Details on suicide among US physicians: data from the National Violent Death Reporting System. *Gen Hosp Psychiatry* 2013;**35**:45–9.
- Mohamed SA. The relationship between organizational justice and quality performance among healthcare workers: a pilot study. *Sci World J* 2014;**2014**:757425.
- Virtanen P, Janlert U, Hammarstrom A. Exposure to temporary employment and job insecurity: a longitudinal study of the health effects. *Occup Environ Med* 2011;**68**:570–4.
- Cooper RA, Getzen TE, McKee HJ, Laud P. Economic and demographic trends signal an impending physician shortage. *Health Aff (Millwood)* 2002;**21**:140–54.
- Newman CJ, de Vries DH, d'Arc Kanakuze J, Ngendahimana G. Workplace violence and gender discrimination in Rwanda's health workforce: Increasing safety and gender equality. *Hum Resour Health* 2011;**9**:19.
- Alexy EM, Hutchins JA. Workplace violence: a primer for critical care nurses. *Crit Care Nurs Clin North Am* 2006;**18**:305–12.
- Park JB, Nakata A, Swanson NG, Chun H. Organizational factors associated with work-related sleep problems in a nationally representative sample of Korean workers. *Int Arch Occup Environ Health* 2013;**86**:211–22.
- Pai HC, Lee S. Risk factors for workplace violence in clinical registered nurses in Taiwan. *J Clin Nurs* 2011;**20**:1405–12.
- Chen WC, Hwu HG, Kung SM, Chiu HJ, Wang JD. Prevalence and determinants of workplace violence of health care workers in a psychiatric hospital in Taiwan. *J Occup Health* 2008;**50**:288–93.
- Lahelma E, Lallukka T, Laaksonen M, Saastamoinen P, Rahkonen O. Workplace bullying and common mental disorders: a follow-up study. *J Epidemiol Community Health* 2012;**66**:e3.