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**Title:**

Impact of Mental Disorders on Work Performance in A Community Sample of Workers in Japan: the World Mental Health Japan Survey 2002-2005

**Short title:** Mental disorders and work performance among workers

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## **Abstract:**

Most studies that investigate the impact of mental disorders on work performance have been conducted in western countries, but this study examines the impact of common mental disorders on sick leave and on-the-job work performance in a community sample of Japanese workers. Data from the World Mental Health Japan survey were analyzed. A subsample of 530 workers aged 20-60 years were interviewed using the WHO Composite International Diagnostic Interview 3.0. Using a WHO Health and Work Performance Questionnaire, sick days and on-the-job work performance for the previous 30 days were assessed. Linear regression was used to estimate the impact of mental disorders on these indicators of work performance over 12 months. Mood disorders, including major depressive disorder, and alcohol abuse/dependence were significantly associated with decreased on-the-job performance. There were no significant associations between mental disorders and sick/absent days. Consistent with previous studies, major depression has a great impact on on-the-job work performance in Japan. The lost productivity was estimated at approximately 28-30 lost days per year. A similar decrease in on-the-job work performance was found for alcohol abuse/dependence, which is stronger than that in other countries, probably attributable to greater tolerance of problematic drinking at Japanese worksites.

**Key words :** absenteeism; presenteeism; HPQ; culture; cost



## **1. Introduction**

Mental disorders are known to be prevalent in the general population, and in the working population (Demyttenaere et al., 2004; Sanderson and Andrews, 2006), which highly impairs life and role functions (Merikangas et al., 2007; Scott et al., 2009). Influences of mental disorders include loss of work productivity, which has been reported to create significant costs for the workplace (Greenberg et al., 2003; Stewart et al., 2003; Kessler et al., 2006). Estimating the impact of mental disorders on work productivity is important to set priorities and plan appropriate interventions for mental disorders in the workplace (Kessler et al., 2006; Loeppke et al., 2007). Work productivity losses consist of two components: absenteeism and presenteeism (Sanderson and Andrews, 2006). The former refers to the number of work days lost due to mental disorders; presenteeism refers to impaired work performance on the job, often described as extra effort days or work cutback days (i.e., work days with reduced work performance) or self-rated work performance (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000; Kessler et al., 2006) .

To date, five community-based epidemiologic studies have been conducted to measure the association between mental disorders and work productivity by using standardized diagnostic criteria, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Kessler and Frank, 1997; Dewa and Lin, 2000; Laitinen-Krispijn and Bijl, 2000; Lim et al., 2000; Kessler et al., 2006). Four of these studies were included in a systematic review by Sanderson & Andrews (2006). These studies demonstrated that major depression, bipolar disorders, and dysthymia were associated with increased absent days (Laitinen-Krispijn and Bijl, 2000; Lim et al., 2000; Kessler et al., 2006).

One study reported an unexpected finding: any mood disorder was significantly associated with decreased absent days (Dewa and Lin, 2000). For anxiety disorders, only one study has reported that a simple phobia was associated with increased absent days among males (Laitinen-Krispijn and Bijl, 2000); otherwise, no statistically significant association has been found between anxiety disorders and absenteeism (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000). Some studies have reported that alcohol dependence (Kessler et al., 2006) and substance or drug use disorder (Laitinen-Krispijn and Bijl, 2000; Kessler et al., 2006) were associated with increased absent days, but one study found no statistically significant association between alcohol or substance use disorders and absent days (Lim et al., 2000)

For presenteeism, three studies have confirmed that mood disorders (or affective disorders) were associated with increased cut-back days or extra effort days (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000), including major depression (Kessler and Frank, 1997; Lim et al., 2000; Kessler et al., 2006) and bipolar disorder (Kessler et al., 2006). Anxiety disorders were associated with increased cutback days or extra effort days in all studies that examined such an association (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000). Generalized anxiety disorder (GAD) (Kessler and Frank, 1997; Lim et al., 2000), panic disorder, simple phobia, social phobia and agoraphobia (Kessler and Frank, 1997) were also associated with cutback days. Substance disorders (Kessler and Frank, 1997; Dewa and Lin, 2000), including alcohol and substance dependence (Kessler and Frank, 1997) also were associated with increased cutback days. The previous literature has indicated two important points: depressive disorder is more consistently

associated with decreased work productivity (both for absenteeism and presenteeism); and, the impact of mental disorders has been more consistently observed for presenteeism than absenteeism.

All previous research was conducted in western countries. To our knowledge, there is no previous study on absenteeism or presenteeism due to a wide range of mental disorders using an internationally standardized diagnostic criteria and its well-established measure in a community sample of a non-western country, such as Japan. Therefore, it is safe to say that the effects of mental disorders in diverse socio-cultural backgrounds have not been investigated. We should not simply transfer data regarding the costs of work disability from western studies for two reasons. First, cross-national variation in prevalence and impairments of mental disorders has been shown (Demyttenaere et al., 2004), so we cannot demonstrate accurate losses in work productivity caused by mental disorders without investigating Japanese data. Second, although work disability is greater in high-income countries than in low and middle-income countries (Ormel et al., 2008), other social and behavioral characteristics (i.e. worksite norms, culture or labor politics) may affect the association between mental disorders and decreased work productivity.

"Karo-jisatsu" (work-related suicide) is has been claimed, at least in part, attributable to the fact that workers in Japan continue to work even when they feel sick (Nishiyama and Johnson, 1997; Hiyama and Yoshihara, 2008). In addition, although average number of annual working hours per employed person was 1,714 h in Japan in 2009, which is medium length among the Organisation for Economic Co-operation and Development (OECD) countries and has been decreasing during this decade (OECD, 2010), proportion of workers working long hours, in 2001, is

28.1%, the highest in the developed societies (Lee, 2004). With these workaholic norms and workplace hierarchical social structure, Japanese workers who suffer from mental disorders may not take days off, but remain at the workplace, with deteriorating on-the-job work performance. Because Japan is known to have a permissive social climate for drinking problems, (Milne, 2002; Hiro et al., 2007), such a workplace environment might allow workers with alcohol abuse/dependence to continue at the workplace, leading to decreased on-the-job work performance.

In addition, previous studies featured significant methodological variations in measuring absenteeism and presenteeism. Particularly for presenteeism, some studies used the number of cut-back days, while more recent studies used self-reported work performance using the WHO Health and Performance Questionnaire (HPQ), a standardized measure of absenteeism and presenteeism (Kessler et al., 2003; Kessler et al., 2004). Other methodological variations include the use of a broad diagnostic category (such as mood disorders) or specific diagnoses (such as major depression). It would be desirable to compare the impact of mental disorders on work performance while using a common measure of absenteeism and presenteeism by specific diagnosis.

The aim of the present study is to estimate the impact of mental disorders on work performance (absenteeism and presenteeism), as well as to ascertain the prevalence and demographic correlates in a community sample of workers in Japan who took part in the World Mental Health Japan (WMHJ) 2002-2005 surveys. This study provides the first findings regarding the association between mental disorders and work performance of community worker samples in a non-western country. The study also assessed absenteeism and presenteeism using the WHO HPQ

associated with specific DSM-IV mental disorders.

## **2. Methods**

### **2.1. Subjects**

The data used in this study comes from the World Mental Health Japan (WMH-J) 2002-2005 Survey (Kawakami et al., 2005). The WMH-J is an epidemiological survey of nine areas in Japan, including three larger cities and six rural municipalities. Carried out as part of the World Health Organization's World Mental Health (WMH) Survey Initiative (Demyttenaere et al., 2004), the survey was given to household residents aged 20 and older. The nine WMH-J sites were selected based on geographic variation, availability of site investigators, and local government cooperation. Interviews were carried out face-to-face with a total of 3,417 respondents across the sites for a total response rate of 59.2%.

First, work-related measures were included in the part 2 sample (n=1,305). 819 answered that they were employed in part 2 sample. 684 completely answered completed all questions used in this study, and 530 met inclusion criteria (either employed or self-employed 20 hours or more per week, aged 20-60 years). Therefore, this subsample of 530 respondents was used in the following analyses.

The data reported here were weighted to adjust for differential probabilities of selection and non-response. Details of the WMHJ design, field procedure and sample weights have been reported previously (Kawakami et al., 2005). The Human Subjects Committees of Okayama University, Japan National Center of Neurology and Psychiatry and Nagasaki University approved this study's



recruitment, consent, and field procedures.

## 2.2. Diagnosis of mental disorders

12-month and 30-day prevalences of mental disorders were assessed with Version 3.0 of the WHO Composite International Diagnostic Interview (CIDI) (Kessler and Ustun, 2004), a structured diagnostic interview designed to be administered by trained lay interviewers to generate diagnoses according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association., 1994).

## 2.3. Socio-demographic correlates

The sociodemographic variables included sex, age (20-29, 30-44, 45-60), education (less than high school, completed high school, some college, completed college), occupation ("Managers/professional", "Clerks (non-manual)", "Manual") and average expected work hours per week (20-39, 40 or more).

## 2.4. Work performance

Work performance was assessed using the WHO Health and Work Performance Questionnaire (HPQ; (Kessler et al., 2003; Kessler et al., 2004)). The HPQ includes a self-reporting assessment of sickness/absence days in the month (30 days) before the survey along with a scale of on-the-job work performance in the same timeframe. The on-the-job work performance scale is a 0-to-10 self-anchoring scale in which 0 indicates the worst work performance that a person could have on their job and 10 represents performance of top worker on their job. We used this 0-to-10 scale as an on-the-job work performance measure. Although there have been several methods

created to assess work performance, no gold standard has been confirmed. It is argued that a 0-10 rating regarding work performance generates greater advantages than the assessments of perceived impairment used in previous studies (Kessler et al., 2003; Mattke et al., 2007). For example, Mattke et al., (2007) described the following three benefits: (1) benchmarking one's perceived performance provides a reference against which loss can be measured; (2) the values garnered from a 10-point performance scale or percentage scale can be more easily incorporated into a monetization formula; (3) attempts have been made to validate this 10-point scale by comparing it with supervisors' assessments or more objective archival performance measures of job performance (Kessler et al., 2003; Kessler et al., 2004; Mattke et al., 2007). For these reasons, we adopted a 10-point scale work performance measure, a method that has been used in recent research regarding workplace costs of adult attention deficit hyperactivity disorder (Kessler et al., 2008).

## 2.5. Statistical analysis

All analyses were performed using survey procedures in SAS version 9.1.3 (SAS Institute Inc., Cary, NC, USA) or SAS-callable SUDAAN version 9.0 (Research Triangle Institute, Research Triangle Park, NC, USA) in order to account for the survey design of the WMH-J (see (Kawakami et al., 2005) for details).

First, we estimated 12-month prevalence of each mental disorder within the subsample of 530 employed respondents to part 2 of the WMH-J 2002-2005 survey. Next, a subgroup comparison of prevalence estimates was used to study the sociodemographic correlates of mental disorders by calculating odds ratios adjusted for sex and age-cohorts. Linear regression analysis was used to

estimate associations of mental disorders with work performance over 30-days and 12-months. In order to conduct stable estimates of the mental disorders over 12 months, we included the mental disorders that had 15 or more unweighted cases in the analysis of sociodemographic correlates.

Mental disorders were coded as yes-no dummy predictor variables in linear regression analyses, whereas sociodemographic variables (sex, age, education, occupation, expected work time) were included as controls. The dependent variables in these linear regression equations were measures of the continuous outcomes of number of sickness absence days and on-the-job work performance.

### **3. Results**

#### **3.1. Prevalence and sociodemographic correlates**

Estimates of twelve-month prevalence (standard errors in parentheses) of DSM-IV mental disorders among employed WMHJ respondents are shown in Table 1. Major depressive disorder was the most frequent disorder in the employed sample, followed by specific disorder and alcohol abuse in last twelve-months. Approximately 9% of working people had some mental disorder over the 12 months.

There were few sociodemographic correlates of mental disorders. Major depressive disorder was significantly lower among workers whose education included some college when compared with those who completed college (OR=0.2, 95% Confidence Interval [CI] 0.04-0.97). It also was significantly lower among clerks than managers/professionals (OR=0.4, 95%CI 0.1-0.9). As for anxiety disorders, less educated workers who did not complete high school had a greater

12-month prevalence of specific phobias than workers who completed college (OR=5.6, 95%CI 1.2-27.3). Substance disorders were higher in men (OR=22.3, 95%CI 2.1-236.0; OR=24.0, 95%CI 2.3-254.0) than women. Substance use disorders were more common in 20-29-year-old workers than 45-60-year-old workers. There were no significant sociodemographic correlates among any other mental disorders.

### 3.2. Associations of mental disorders with work performance

Only social phobia significantly predicted the expected duration of sickness/absence days (Table 2). Having this disorder was associated with an increase in absent days; however, it did not remain a significant predictor after adjusting for age, sex, education, occupation and expected number of hours of work per week. Major depressive disorder, mood disorders and alcohol abuse/dependence significantly predicted on-the-job performance (Table 3). Having these disorders was associated with a decrease in work performance. All these disorders remained significantly and any substance use disorder turned into as a significant predictor after adjusting for age, sex, education, occupation and expected number of hours of work per week.

The 30-day prevalence of major depressive disorder ( $b=-1.9$ , 95%CI -3.6 to -0.3) and any mood disorder ( $b=-2.0$ , 95%CI -3.1 to -1.0) was significantly associated with a decrease in work performance, after adjusting for age, sex, education, occupation and expected number of working hours per week. On the other hand, generalized anxiety disorder ( $b=0.8$ , 95%CI 0.3 to 1.3) and IED ( $b=1.2$ , 95%CI 0.5 to 1.9) were associated with an increase in work performance.

## 4. Discussion

The present study indicates that major depressive disorder and alcohol abuse/dependence were positively associated with decreased on-the-job performance (presenteeism) in this sample of workers in Japan, while no mental disorders were associated with absence days (absenteeism). Additional analyses indicated that major depression was associated with decrease in on-the-job performance over 30 days

None of the mental disorders under this study were significantly associated with absence days. This finding is inconsistent with previous community epidemiological studies that major depressive disorder were associated with an increase OR=1.87 for 1 year presence of sickness absence in men (Laitinen-Krispijn and Bijl, 2000) , with an increase 8.7 work loss days due to absenteeism for 1 year (Kessler et al., 2006) and 1.39 work loss days in the past month for depression (Lim et al., 2000) or even -0.3 additional disability days in past 30-day(Dewa and Lin, 2000). It also conflicts with a previous study indicating that Bipolar disorder was associated with an increase 27.7 work loss days due to absenteeism for 1 year (Kessler et al., 2006) and alcohol- and substance-use disorders were associated with 0.1 to 0.25 increased absence days in past 30-day (Kessler and Frank, 1997). However, it is consistent with above community epidemiological studies that found no association between mood disorders (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000), anxiety and substance-related disorders (Dewa and Lin, 2000), anxiety disorders (Kessler and Frank, 1997; Lim et al., 2000) or substance disorders (Lim et al., 2000) with absent days. Having a common mental disorder might not be strongly associated with sick absence in the Japanese working population, as observed in a few studies.

Any mood disorder and any substance use disorder, particularly major depression and alcohol abuse, were associated with a decrease in on-the-job performance in the present study. This finding is consistent with 2.77 to 4.17 cut-back days for major depression in past 30 days (Kessler and Frank, 1997; Lim et al., 2000), 18.2 work loss days due to absenteeism for major depressive disorder for 1 year (Kessler et al., 2006) and 0.17 cut-back days for alcohol abuse and 0.88 cut-back days for alcohol dependence in past 30 days (Kessler and Frank, 1997) . Like the previous studies (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000), among mental disorders, mood disorders had the largest impact on decreased on-the-job work performance.

The NCS-R study, which used the same measure of on-the-job work performance, reported that the work performance equivalent to 18.2 days per year was lost due to major depression (Kessler et al., 2006). Following a formula used in prior studies (Kessler et al., 2008), their estimate could be converted into a regression coefficient of -0.73 (-18.2 days divided by 250 annual work days and multiplied by 10), which was smaller than that observed in this WMHJ study. The impact of major depression on on-the-job work performance may be greater in the working population in Japan than it is in US, possibly resulting from the workaholic norm in Japanese workplaces, which prevents those who were sick from leaving the workplace. However, because of the difference in measurement of on-the-job work performance, we could not compare the present estimate with previous studies reporting 2.8-4.2 cut back days in the past 30-days as associated with major depressive disorder (Kessler and Frank, 1997; Lim et al., 2000).

In this study, the association between alcohol abuse/dependence and work performance

loss was significant, and also similar to that for major depressive disorder. Meanwhile, alcohol abuse/dependence was non-significantly associated with a slightly smaller number of sick leave days. This pattern may be unique to Japan because previous studies in western countries consistently showed greater decreases in work performance due to major depressive disorder than from alcohol abuse/dependence (Kessler and Frank, 1997; Dewa and Lin, 2000; Lim et al., 2000). In Japan, workers with alcohol abuse/dependence may be more likely to remain at their workplace, with deteriorated work performance instead of taking sick leave. This situation likely occurs because Japanese workplaces are more tolerant of problem drinking. For instance, heavily-drinking workers receive greater social support at work (Hiro et al., 2007). The present study indicated that the impact of mental disorders (particularly major depressive disorders and alcohol abuse/dependence) on work performance may vary from country to country, depending on characteristics of worksite culture and other labor-related factors. A future study should focus on the variability of the impact of mental disorders on decreases in work performance across countries, applying similar measure of work performance.

It was unexpected that the 30-day prevalence of GAD and IED was associated with increased on-the-job work performance. Previous studies have shown additional 3 to 4 work cut-back days among workers with GAD in the past 30 days (Kessler and Frank, 1997; Lim et al., 2000). No study reported the impact of IED on work performance. The impacts of GAD and IED may be lessened in Japan. Increased work performance for these disorders might be attributable to the self-rated measure of work performance. Those with anxiety or low impulse control may rate

their work performance higher on such a scale. Detailed investigations with multiple measures of work performance loss due to GAD and IED are needed.

As we expected, we found low absenteeism but high presenteeism associated with major depression and alcohol abuse/dependence among workers in Japan. Employees tend to have fewer sick leave days on average in Japan than in Western countries (Muto et al., 1999; Kondo et al., 2006), with taking a paid annual leave for only a few days when they are sick (Otsuka et al., 2007; Nakata et al., 2011). Only one fourth to one third of the total paid annual leave days given to employees were utilized in Japan (Ogura, 2004). Several anecdotal reports have described that workers in Japan continue to work even when they feel sick (Nishiyama and Johnson, 1997; Hiyama and Yoshihara, 2008), because of the workaholic norms, social pressure from supervisors and coworkers in their workplace. Such social and cultural characteristics background of companies in Japan may explain the finding. In addition, only one fourth of people who suffered from mental disorders sought professional help in Japan (Wang et al., 2007a), which was the lowest among developed countries. Thus most workers may not be aware of their having mental disorders. This may also be a reason for high presenteeism associated with mental disorders. Furthermore, specific to alcohol abuse/dependence, a permissive social climate for drinking problems in Japan (Milne, 2002; Hiro et al., 2007) might be an additional reason for high presenteeism associated with alcohol abuse/dependence.

According to the method used in Kessler et al (2008), we calculate the day equivalent measure of performance decreases with those disorders that were significant predictors of work



performance. The 0-10 work performance scale was used to represent proportional work performance (0-100%). Workers with major depression were estimated to have about 11-12% lower on-the-job performance than other workers. As for individual level, in a 250-day work year, this is equivalent to approximately 28-30 lost days of productive work or ¥453394-¥494611 yen lost annual salary associated with major depression (Ministry of Health, 2003). In the same manner, the lost days of productive work for alcohol abuse or dependence was 28 days. As for societal level, lost days of productive work which were multiplied by the number of workers with each mental disorder calculated from prevalences, were 31.4 million days for major depression and 20.5 million days for alcohol abuse or dependence. Next, above lost annual salary were multiplied by the number of workers with each mental disorder, there were approximately ¥508 billion yen for major depression and ¥332 billion yen for alcohol abuse or dependence, respectively. It should be glanced that many people might rate themselves as 10, a top worker in US, and might not rate themselves as a top worker in other countries (Iwata et al., 1995; Lee et al., 2002). We calculated the frequency of each 0-10 point and found that 4.0% of worker rated 10 and 6% rated 9 themselves in Japan. These numbers seem not so extremely small. It would be needed, however, to describe a prevalence of a top worker in future international comparison.

Our prevalence estimates of mental disorders in an employed WMHJ subsample slightly varied from the whole community sample; they are almost consistent with the whole community sample (Kawakami et al., 2005). This difference might have occurred because of the younger age in the employed subsample. The prevalence was lower in Japan than in western countries

(Demyttenaere et al., 2004; Kawakami et al., 2005). Consistent with previous studies of employed community samples, major depression, specific phobia and alcohol abuse were the most common mental disorders (Sanderson and Andrews, 2006). We can compare these findings directly with only two epidemiological surveys that investigated the prevalence of mental disorders over 12 months in employed samples (Laitinen-Krispijn and Bijl, 2000; Kessler et al., 2006).

There are a few implications from our results. A previous study indicates that sickness presenteeism may lead to a future long-term sick absence, while the finding was not specific to mental disorders (Bergstrom et al., 2009). Workers who suffer from mental disorders possibly need to take a day off to cope with work burden or to access to medical care; otherwise, they might take a long-term sick absence in future. Changing workplace norms and supervisor attitude to allow workers to have more control over taking sick absence could be beneficial to workers with mental disorders and their employers in a country like Japan in which high presenteeism associated with mental disorders. For alcohol abuse/dependence, appropriate interventions should be designed and implemented for early detection and treatment of the disorder, which is often masked by a workplace culture in Japan which is permissive for drinking.

## **Limitations**

The present findings must be considered within the following limitations. First, the survey sites were selected from available areas in Japan, so it may not be completely representative of the national population because the data did not include a metropolitan city with a population of more than one million. The low response rate (59.2%) may also have limited the interpretation of the

results, leading to underestimation or overestimation of prevalence. Second, although the HPQ is a validated scale, a psychometric comparison study should be conducted regarding the meaning of a 0-10 performance scale. Third, cases of mental disorders were so small that 95% CIs were wide and some important mental disorders (e.g. bipolar disorder) could not be estimated. Fourth, impact of mental disorders on work performance might be underestimated, because workers who suffer with severe symptoms of mental disorders possibly lose their job or attempt suicide (Dickerson et al., 2008).

Even within the context of these limitations, we found a substantive impact of mental disorders on work performance in Japan. To our knowledge, these results represent the first community-based epidemiological study to show mental disorders data in a non-western country. Future research should be conducted to replicate these findings in other East Asian countries as well as additional non-western countries in order to explore possible reasons for the observed cross-national differences.

Finally, we should view the consequence of workers' mental disorders from the perspective of return-on-investment; we found associations between some mental disorders and lost work productivity. From the employer's perspective, it is important to recognize lost work productivity as potential costs that might be reduced with best-practices, such as outreach and treatment of mental disorders (Wang et al., 2007b; Kessler et al., 2008).

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**Declaration of interest**

None.

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Table1. 12-month prevalence of DSM-IV mental disorders among  
employed respondents in WMHJ

Mental disorders	weighted n	%	SE
Mood disorder			
Major depressive disorder	14.1	2.6	0.7
Dysthymia	1.3	0.3	0.2
Bipolar_I_II	1.6	0.3	0.3
Any mood disorder	15.7	2.9	0.8
Anxiety disorder			
Specific phobia	12.5	2.3	0.4
Social phobia	5.7	1.1	0.7
Agoraphobia without panic disorder	0.4	0.1	0.1
Generalized anxiety disorder	5.3	1.0	0.3
Panic Disorder	3.3	0.6	0.3
Posttraumatic Stress Disorder	2.6	0.5	0.3
Any Anxiety Disorder	27.2	5.1	0.9
Substance use disorder			
Alcohol Abuse	8.7	1.6	0.6
Alcohol Dependence	1.4	0.3	0.2
Any Substance Use Disorder	9.2	1.7	0.6
Intermittent Explosive Disorder	3.7	0.7	0.3
Any Mental Disorder	48.7	9.1	1.1

n=530; SE, standard error;



Table2 . The relationships between mental disorders over 12 months and sick absent days among 530 employed respondents to part 2 of the World Mental Health Japan 2002-2005

Mental disorders	Regression coefficients (12-month)							
	With each		Without each					
	12-month disorder		12-month disorder		Model1†		Model2‡	
	Mean	(S.E.)	Mean	(S.E.)	Estimate	(95% CI)	Estimate	(95% CI)
Mood disorders								
Major depressive disorder	0.6	0.4	0.6	0.1	0.0	-0.8 to 0.8	-0.0	-0.9 to 0.9
Any mood disorder	0.6	0.4	0.6	0.1	-0.1	-0.8 to 0.7	-0.0	-0.8 to 0.8
Anxiety disorders								
Specific phobia	1.8	1.1	0.6	0.1	1.1	-1.2 to 3.3	1.2	-1.1 to 3.4
Social phobia	0.6	0.5	0.6	0.1	0.9	0.1 to 1.8	-0.0	-1.3 to 1.2
GAD	1.7	0.9	0.6	0.1	1.0	-0.9 to 2.9	1.1	-0.8 to 3.0
Panic disorder	0.5	0.2	0.6	0.1	-0.2	-0.7 to 0.3	-0.1	-0.5 to 0.3
Any anxiety disorder	1.5	0.6	0.6	0.1	1.1	-0.1 to 2.3	1.0	-0.3 to 2.2
Substance use disorders								
Alcohol abuse or dependence	-0.2	0.5	0.6	0.1	-0.4	-0.8 to 0.0	-0.8	-2.0 to 0.3
Any substance use disorder	-0.2	0.5	0.6	0.1	-0.4	-0.8 to 0.0	-0.9	-2.0 to 0.3
Intermittent Explosive Disorder	1.4	0.6	0.6	0.1	0.8	-0.3 to 1.9	0.8	-0.5 to 2.1

Any disorder	1.0	0.3	0.6	0.1	0.5	-0.3 to 1.3	0.4	-0.4 to 1.2
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†Based on ordinary least-squares regression analysis in which a dummy predictor variable that distinguished between workers with mental disorders (coded 1) and other workers (coded 0) was used to predict the continuous outcomes.

‡Adjusted for sex, age-cohort, education, occupational category and work time on model1.

n=530; means were adjusted for covariate

S.E., standard error; 95% CI, 95% confidence interval

Table3 . The relationships between mental disorders over 12 months, and on-the-job work performance among 530 employed respondents to part 2 of the World Mental Health Japan 2002-2005

Mental disorders	Regression coefficients (12-month)							
	With each 12-month disorder		Without each 12-month disorder					
					Model1†		Model2‡	
	Mean	(S.E.)	Mean	(S.E.)	Estimate	(95% CI)	Estimate	(95% CI)
Mood disorders								
Major depressive disorder	5.9	0.3	7.0	0.1	-1.2	-2.0 to -0.4	-1.1	-1.8 to -0.3
Any mood disorder	5.8	0.3	7.0	0.1	-1.3	-2.0 to -0.6	-1.2	-1.8 to -0.5
Anxiety disorders								
Specific phobia	7.0	0.3	6.9	0.1	0.1	-0.7 to 0.8	0.3	-0.7 to 0.7
Social phobia	7.6	0.6	6.9	0.1	0.6	-0.4 to 1.5	0.7	-0.6 to 1.9
GAD	7.0	0.4	6.9	0.1	0.1	-0.5 to 0.7	0.1	-0.7 to 0.9
Panic disorder	6.6	0.7	6.9	0.1	0.2	-0.7 to 1.1	-0.3	-1.8 to 1.1
Any anxiety disorder	7.1	0.2	6.9	0.1	0.2	-0.2 to 0.7	0.2	-0.3 to 0.6
Substance use disorders								
Alcohol abuse or dependence	5.9	0.5	7.0	0.1	-1.1	-2.1 to -0.0	-1.1	-2.1 to -0.1
Any substance use disorder	6.0	0.5	7.0	0.1	-1.0	-2.0 to 0.0	-1.0	-2.0 to -0.0

Intermittent Explosive Disorder	6.4	0.8	6.9	0.1	-0.2	-1.7 to 1.3	-0.5	-2.1 to 1.1
Any disorder	6.5	0.2	7.0	0.1	-0.5	-1.1 to 0.1	-0.5	-1.0 to 0.0

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†Based on ordinary least-squares regression analysis in which a dummy predictor variable that distinguished between workers with mental disorders (coded 1) and other workers (coded 0) was used to predict the continuous outcomes.

‡Adjusted for sex, age-cohort, education, occupational category and work time on model1.

n=530; means were adjusted for covariate

S.E., standard error; 95% CI, 95% confidence interval