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Author(s)	Hirokawa, Kumi; Ohira, Tetsuya; Kajiura, Mitsugu; Imano, Hironori; Kitamura, Akihiko; Kiyama, Masahiko; Okada, Takeo; Iso, Hiroyasu
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## Job stress factors measured by Brief Job Stress Questionnaire and sickness absence among Japanese workers : A longitudinal study

Kumi Hirokawa<sup>1,2)</sup>, Tetsuya Ohira<sup>2,3,4)</sup>, Mitsugu Kajiura<sup>4)</sup>, Hironori Imano<sup>2)</sup>, Akihiko Kitamura<sup>4,5)</sup>, Masahiko Kiyama<sup>4)</sup>, Takeo Okada<sup>4)</sup> and Hiroyasu Iso<sup>2)</sup>

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<sup>1)</sup>Department of Nursing, Baika Women's University, Osaka, Japan, <sup>2)</sup>Public Health, Department of Social Medicine, Osaka University Graduate School of Medicine, Osaka, Japan, <sup>3)</sup>Department of Epidemiology, Fukushima Medical University School of Medicine, Fukushima, Japan, <sup>4)</sup>Osaka Center for Cancer and Cardiovascular Disease Prevention, Osaka, Japan, <sup>5)</sup>Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan

### Abstract

This study aimed to investigate associations between Brief Job Stress Questionnaire (BJSQ)-measured job stress factors and sickness absence in Japanese workers. Among 551 healthy, employed Japanese men and women (age range : 21-73 years) who underwent mental health examinations at the Osaka Medical Center for Health Science and Promotion between 2006 and 2009, 197 (67 men, 130 women) consented to participate in this study. Their sickness absences until the end of March 2010 were then followed-up via postal mail survey, with 112 participants effectively responding to the question on sickness absence (56.9%). The hazard ratio (HR) and 95% confidence interval (CI) were calculated using the Cox proportional hazards model, adjusting for age, sex, and lifestyle factors. Among the 112 respondents, 12 took sickness absence after their study entry, as found during the mean 2.3 years of follow-up (258.8 person-years). Among all sickness absences, those of eight participants were because of mental illness. Physical demands were positively associated with increased risks of all sickness absence (adjusted HR : 2.78, 95% CI : 1.01-7.64). Physical demands were predictive for all sickness absence, and should be alleviated at workplaces to prevent such absence.

**Key words :** depressive symptoms, job stressor, physical demands, physical environment, sickness absence

### Introduction

Sickness absence due to chronic illnesses such as mental illnesses, diabetes mellitus, cardiovascular diseases, cancer, respiratory diseases, low back pain, and musculoskeletal problems can significantly decrease productivity<sup>1)</sup>. An adverse psychosocial work environment, including burdensome job demands and poor job control, has been found to increase the risk of sickness absence<sup>2-6)</sup>. Of special note, the psychosocial work environment can greatly impact mental well-being<sup>5)</sup>. Indeed, a systematic

review revealed that adverse work environment, with aspects such as low decision latitude, high job stress, and bullying, increased depressive symptoms over time<sup>7)</sup>.

In recent years, certified industrial accidents due to mental disorders have been increasing in Japan<sup>8)</sup>. To prevent mental disorders, from December 2015, changes based on amendments to Japan's Industrial Safety and Health Act have required employers to introduce a "stress-check system" in workplaces that have  $\geq 50$  regular employees. Workplaces with  $< 50$  regular employees are encour-

Corresponding author : Tetsuya Ohira E-mail : fwge1119@mb.infoweb.ne.jp

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aged, but not required, to administer such checks. This system is aimed at preventing work-related illness by helping employees identify impacts of job stress, and helping employers improve their work environments.

The Ministry of Health, Labour and Welfare of Japan<sup>9)</sup> recommended use of the Brief Job Stress Questionnaire (BJSQ)<sup>10)</sup> for the stress check. This consists of 57 items graded on a four-point Likert-type scale to measure job stressors (17 items), psycho-physical complaints (29 items), support for workers (nine items), and job and life satisfaction (two items). A few prospective studies have examined associations between the BJSQ and sickness absence. One revealed that the upper quartile among psycho-physical complaints increased risk of sickness absence due to depression or depressive symptoms<sup>11)</sup>. Another showed that high quantitative job overload increased risk of recurrent sickness absence due to depression<sup>12)</sup>. Recently Tsutsumi *et al.*<sup>13)</sup> investigated whether high stress levels as per the BJSQ and, in accordance with the above-mentioned Ministry's recommendation of a stress check program manual, can predict sickness absence. High stress is defined as the highest level of stress response or having a moderate or higher level of stress response, together with the highest level of job stressors (or lowest level of social support in the workplace). Employees with high stress levels have an elevated risk of long-term sickness absence<sup>13)</sup>.

Since 2010 and before the introduction of the stress-check system, mental health checkups have been conducted at the Osaka Medical Center for Health Science and Promotion to examine the association of mental stress levels with somatic and psychological symptoms. In one of the stress response examinations at the checkups, participants were assessed on their acute cardiovascular reactivity to stressful tasks through measurements of their blood pressure, heart rate, heart rate variability, and peripheral blood flow. Our previous study investigated associations between the BJSQ and acute cardiovascular reactivities to stressful tasks<sup>14)</sup>. Among the job stressors in the BJSQ, not only quantitative but also qualitative job overload, physical demands, and poor physical environment were associated with the measured reactivity. Although a previous study by Endo *et al.*<sup>12)</sup> used only quantitative job overload for job stressors in relation to recurrent sickness absence, other job stressors may be predictive for sickness absence. While the stress-check system has been mandated for workplaces with  $\geq 50$  regular

employees, the abovementioned mental health checkups included employees, such as teachers, who are in workplaces with  $< 50$ . Our data allowed us to investigate associations between job stressors as measured via the BJSQ and sickness absence with employees including those in smaller workplaces and before introduction of that system.

The present study aimed to investigate associations between job stressor factors as measured by the BJSQ and sickness absence in Japanese workers. We hypothesized that quantitative and qualitative job overload, physical demand, and poor physical environment were positively associated with sickness absence risk. We also investigated whether those job stressors were associated with that risk after controlling for depressive symptoms.

## Subjects and methods

### *Mental health checkups*

A "physical and mental refresh course" comprising mental health checkups was conducted at the Osaka Medical Center for Health Science and Promotion between 2001 and 2009. The checkups were conducted to measure associations between stress levels and the effect on somatic and psychological symptoms. Stress levels were assessed using several psychological questionnaires, as well as physiological markers such as blood pressure, heart rate, blood flow, and hormonal indices. Checkups could be applied for through companies in the Osaka region, as well as on the Osaka Medical Center for Health Science and Promotion website.

The data from these checkups have been reported elsewhere<sup>14-16)</sup>, as have the data on cardiovascular reactivity and sickness absences<sup>17)</sup>.

### *Participants*

A total of 551 Japanese workers (212 men, 339 women; age range: 21-73 years) underwent the abovementioned checkups between 2006 and 2009, as the baseline survey. The most frequent occupation reported among workers was teacher (54% of men, 67% of women). This was because enrollment was advertised through health insurance societies in Osaka. The study was explained to all 551 applicants, and 197 (67 men, 130 women) subsequently gave written consent to take part in the study.

Sickness absence data on the 197 participants from the date of their mental health checkups through March 31, 2010, were followed-up using a

postal mailed questionnaire. This included a question on sickness absence: "Have you taken sickness absence since the mental health checkup?" If participants responded "Yes", they were also asked to indicate the date the sickness absence began. If the participants took sickness absence several times, they were instructed to indicate the date of the first time since the checkups. They were asked their reasons for absence from among physical illness, and/or mental illness, and/or other reasons, such as caring for aged parents.

Among the 197 contacted, 119 completed the questionnaire (response rate: 60.4%). A total of 115 (40 men, 75 women) responded regarding whether they had taken sickness absence. Three had taken absence before the mental health checkups, and were therefore excluded from the analyses. Ultimately, 112 (39 men, 73 women) respondents were included in the analysis (effective response rate: 56.8%). Figure 1 is a flowchart on selection of participants in this study. Table 1 shows the participants' measured variables at the baseline.

#### *Ethics approval and consent to participate*

The present study was conducted after obtaining approval from the Ethics Committee of the Osaka Medical Center for Health Science and Promotion (#4).

#### *Questionnaires and measurements*

The BJSQ was used<sup>10)</sup>, with 57 items graded on a four-point Likert-type scale to measure job stressors, psycho-physical complaints, and support for

workers. Cronbach's alpha coefficients, calculated based on the present data, are shown in parentheses. In this study, the effects of quantitative (three items; alpha: 0.82) and qualitative job overload (three items; alpha: 0.73), physical demands (one item), interpersonal conflicts (three items; alpha: 0.64), and poor physical environment (one item) were assessed. Sample items are as follows: "You have to do an enormous amount of work" for quantitative job overload, "You have to focus your attention quite a lot" for qualitative job overload, "You do a lot of physical work" for physical demands, "There are differences of opinion within your department" for interpersonal conflicts, and "The environment of your workplace (noise, light, humidity, and ventilation) is not so good" for poor physical environment.

Depressive symptoms were assessed using the Japanese translation of the Center for Epidemiologic Studies Depression Scale (CES-D)<sup>18,19)</sup>, of which 20 items (alpha: 0.88) were scored from 0 (not at all) to 3 (for >5 days). Although a score of  $\geq 16$  has been used extensively as the cutoff point for classification of "highly depressed" on this scale<sup>18)</sup>, we used the CES-D score and BJSQ score in the present study.

Sex and age were asked about in investigation for potential confounding factors. Participants were asked about their current work, and their occupational status was categorized as manager/professional or general worker. Teachers were categorized as professionals based on preceding studies and vital statistics in Japan<sup>20,21)</sup>. Participants were asked about their smoking status, which was categorized as current smoker or never/ex-smoker, and alcohol

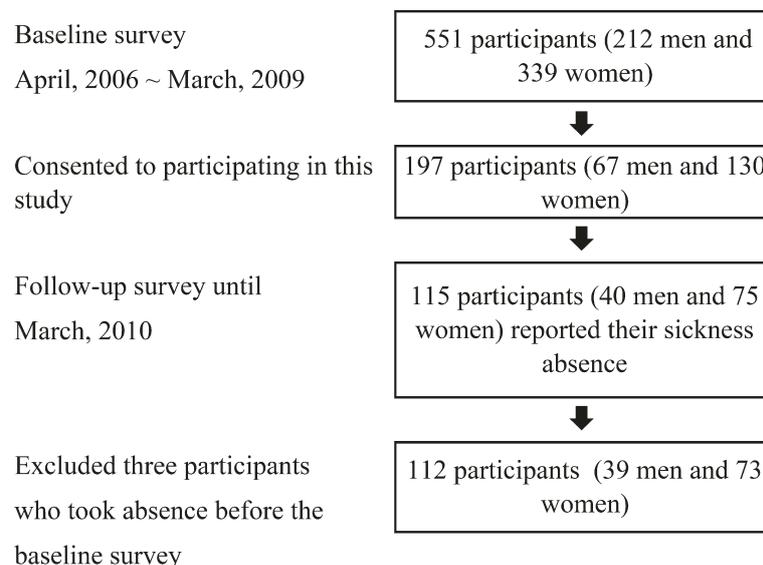


Figure 1. Flowchart of subject selection and participation

Table 1. Participants' means (SDs) and proportions of measured variables

Quantitative job overload	Mean and SD	9.4	2.1
Qualitative job overload	Mean and SD	9.2	1.9
Physical demands	Mean and SD	2.4	0.9
Interpersonal conflict	Mean and SD	7.1	1.7
Poor physical environment	Mean and SD	2.6	0.9
Age (years)	Mean and SD	48.7	8.0
Body Mass Index (kg/m <sup>2</sup> )	Mean and SD	23.1	3.0
Depressive symptoms	Mean and SD	17.2	9.7
Women	%	65.2	
Management position or professional	%	76.8	
(Teachers	%	60.7)	
Current smokers	%	8.9	
Current drinkers	%	50.0	
Physically active	%	56.3	
Medical history of diabetes mellitus	%	5.4	
Medical history of hypertension	%	12.5	
Medical history of hyperlipidemia	%	42.0	

drinking status, which was categorized as current drinker or never/ex-drinker. The scale of the Japan Arteriosclerosis Longitudinal Study was used to evaluate physical activity<sup>22</sup>. Participants were asked whether they had exercised regularly for >15 minutes within the previous 3 months, and were categorized as physically active if they answered "Yes." Information on medication was asked and use of medication for antihypertension, diabetes mellitus, or hyperlipidemia was identified.

Height in feet (wearing stockings or socks) and weight in light clothing were measured at the mental health checkups. Body mass index was calculated (kg/m<sup>2</sup>). Blood pressure was measured, and peripheral blood was collected between 2 p.m. and 4 p.m. at the front desk of the mental health facility. Hypertension was defined as systolic blood pressure  $\geq 140$  mmHg, and/or diastolic blood pressure  $\geq 90$  mmHg, and/or use of antihypertensive medication. Diabetes mellitus was defined as fasting glucose level of  $\geq 126$  mg/dL or non-fasting glucose level of  $\geq 200$  mg/dL, and/or the use of medication for diabetes mellitus. Hyperlipidemia was defined as total cholesterol level  $\geq 220$  mg/dL and/or use of medication for hyperlipidemia. Participants with a medical history of such conditions were categorized as having hypertension and/or diabetes mellitus and/or hyperlipidemia. No participant had a history of stroke or myocardial infarction.

#### Statistical methods

The crude hazard ratio (HR) and 95% confidence interval (95% CI) from sickness absence ac-

ording to job stressors, including quantitative job overload, qualitative job overload, physical demands, interpersonal conflict, and poor physical environment, and age- and sex-adjusted HRs, were calculated using the Cox proportional hazards model. Crude HR, age- and sex-adjusted HRs, and the 95% CIs from sickness absence in accordance with all sickness, excluding other reasons and depressive symptoms, were also calculated. The adjusted HRs and 95% CIs were calculated to investigate associations between the job stressors, depressive symptoms, and sickness absence, adjusting for age, sex (reference : men), occupation (reference : managers/professionals), and alcohol consumption habits (reference : non-drinkers). Among the potential confounding factors, a t-test indicated occupation and alcohol consumption habits were significantly associated with job stressors ; therefore, these two variables were used in the models (Appendix). Teachers, because they were a majority of the participants, were also compared with other occupations in the model (reference : other occupations). All statistical analyses were performed with IBM SPSS Statistics for Windows, Version 25 (IBM Corp., Armonk, NY, USA).

## Results

During the mean 2.3 years (standard deviation : 0.9, range : 0.02-3.69) of follow-up of 112 healthy employees (258.8 person-years), 12 (4 men, 8 women) took sickness absence for any reason and 10 (4 men, 6 women) for all sickness, excluding oth-

Table 2. Details about participants who took sickness absence

No.	Sex	Age	Occupation	Reason of sickness absence
1	Woman	41	Office worker	Mental illness
2	Woman	44	Office worker	Mental illness
3	Woman	56	Teacher	Mental illness
4	Woman	58	Teacher	Mental illness
5	Woman	31	Teacher	Mental illness
6	Woman	61	Teacher	Physical illness
7	Woman	33	Teacher	Other reasons
8	Woman	29	Teacher	Other reasons
9	Man	33	Labor worker	Mental illness
10	Man	52	Teacher	Mental illness
11	Man	51	Teacher	Mental illness
12	Man	54	Teacher	Physical illness

er reasons ; among them, 8 (3 men, 5 women) took sickness absence due to mental illness. Table 2 shows details of those 12 participants.

Table 3 shows crude HRs and adjusted HRs in relation to all sickness absence. For associations between job stressors and all sickness absence, crude and age- and sex-adjusted HRs of physical demands increased, 2.16 (95% CI : 0.96-4.86) and 2.23

(95% CI : 0.98-5.06), respectively. However, those HRs did not reach statistical significance. When HRs were adjusted for all potential confounding factors, physical demands (adjusted HR : 2.78, 95% CI : 1.01-7.64) were found associated with increased risk of sickness absence. When two cases of sickness absence due to other reasons were excluded, physical demands (adjusted HR : 3.07, 95% CI : 1.02-9.25) were strongly associated with an increased risk of sickness absence. The variance inflation factors for age, sex, occupation, and alcohol consumption habits were all low (<1.4), suggesting no multicollinearity problems.

For associations between depressive symptoms and all sickness absence, no HRs reached statistical significance. However, regarding associations between depressive symptoms and sickness absence due to mental illness, the crude HR (1.09, 95% CI : 1.02-1.16) and age- and sex-adjusted HR (1.08, 95% CI : 1.01-1.15) showed increased risks of such absence (Table 3). After adjusting for all confounding factors, the association had lower significance (adjusted HR : 1.07, 95% CI : 0.98-1.16) but still showed the same tendency. Job stressors, however, were not associated with risk of sickness absence due to mental illness.

Table 3. Associations between work stressors, depressive symptoms, and sickness absence

	Crude HR		95% CI	Age and sex adjusted-HR		95% CI	Multivariable adjusted-HR#		95% CI
Sickness absence due to all causes (n = 12)									
Quantitative job overload	0.85	0.60	1.20	0.80	0.55	1.17	0.79	0.51	1.22
Qualitative job overload	0.91	0.56	1.47	1.00	0.60	1.68	0.98	0.52	1.84
Physical demands	2.16	0.96	4.86	2.23	0.98	5.06	2.78	1.01	7.64
Interpersonal conflict	1.17	0.80	1.71	1.08	0.73	1.61	1.12	0.72	1.75
Poor physical environment	1.91	0.92	3.95	1.96	0.93	4.14	2.19	0.92	5.25
Depressive symptoms	1.05	0.99	1.11	1.04	0.99	1.10	1.06	0.98	1.14
Sickness absence due to all sickness (n = 10)									
Quantitative job overload	0.81	0.53	1.24	0.82	0.53	1.25	0.80	0.50	1.27
Qualitative job overload	0.78	0.43	1.45	0.78	0.41	1.46	0.83	0.42	1.64
Physical demands	2.74	0.97	7.77	2.74	0.96	7.88	3.07	1.02	9.25
Interpersonal conflict	1.20	0.75	1.91	1.20	0.75	1.94	1.18	0.73	1.90
Poor physical environment	1.93	0.79	4.73	1.94	0.80	4.73	1.92	0.77	4.78
Depressive symptoms	1.07	0.99	1.15	1.07	0.99	1.15	1.07	0.99	1.16
Sickness absence due to mental problems (n = 8)									
Quantitative job overload	1.21	0.70	2.10	1.19	0.68	2.08	1.05	0.60	1.83
Qualitative job overload	0.70	0.37	1.34	0.73	0.36	1.48	0.86	0.41	1.77
Physical demands	1.89	0.68	5.22	1.86	0.67	5.11	1.65	0.48	5.62
Interpersonal conflict	1.32	0.86	2.02	1.28	0.83	1.98	1.19	0.73	1.94
Poor physical environment	1.48	0.63	3.47	1.48	0.64	3.44	1.38	0.53	3.61
Depressive symptoms	1.09	1.02	1.16	1.08	1.01	1.15	1.07	0.98	1.16

# Age, sex, job position, and alcohol habits were adjusted.

There was no significant association between occupation and sickness absence (adjusted HR : 1.67, 95% CI : 0.22–12.62 for all and 2.08, 95% CI : 0.24–18.26 for mental illness). There was also no significant association when teachers were compared with other occupations (adjusted HR : 2.29, 95% CI : 0.34–15.30 for all and 1.53, 95% CI : 0.19–12.02 for mental illness).

## Discussion

The present study investigated associations between the job stress factors measured by the BJSQ and risk of sickness absence, using the data collected at the mental health checkups. Among 112 participants who were followed-up from their entry in the mental health checkups in 2006–2009 until May 2010, 12 took sickness absence. After adjusting for potential confounding factors, results showed that physical demands were associated with an increased risk of sickness absence. When limited to eight sickness absences due to mental illness, the association between the job stressors in the BJSQ and sickness absence showed the same tendency but was attenuated. Depressive symptoms were associated with increased risks of sickness absence due to mental illness. Physical demands indicated in the BJSQ could be predictive for sickness absence for any reason.

In the present study, workers who performed a great deal of physical work had increased risk of all forms of sickness absence. This result was consistent with previous studies conducted in Denmark and Sweden, collectively revealing that physical work demands were a risk factor for sickness absence<sup>23–25</sup>. Physical demands, such as uncomfortable work positions, including extreme bending of the body or twisting of the neck or back, and working mainly in a standing or squatting position were risk factors for development of musculoskeletal disorders<sup>26</sup>, cardiovascular disease<sup>27</sup>, or sickness absence<sup>24,25</sup>. Uncomfortable working positions, lifting or carrying loads, and pushing or pulling loads also increased sickness absence<sup>23,25</sup>. In our previous study of associations between the job stressors in the BJSQ and cardiovascular reactivities to stressful tasks, physical demands were associated with such reactivities<sup>15</sup>. Notably, physical demands were associated with reactivities of blood pressure and peripheral blood flow in male managers/professionals. Workers who performed a great deal of physical work may be reflective of individual vulnerability to stressors, and their stress responses may increase, which

could lead to health problems and sickness absence. However, in the present study, the majority of sickness absence was due to mental illness. Moreover, there were only two absences due to physical illness, with two for other reasons. Physical demands are a potential risk factor for sickness absence for any reason<sup>28</sup>.

Regarding sickness absence due to mental illness, depressive symptoms were associated, while job stressors measured by the BJSQ were not significantly associated. This result may be attributed to our small sample size, of which the power was insufficient for reaching statistical significance. Another hypothetical reason may be a mediating effect of depressive symptoms between job stressors and sickness absence due to mental illness. A previous study revealed that the upper quartile of psychophysical complaints was predictive for increased sickness absence due to depression<sup>11</sup>. A prospective study of the BJSQ revealed that the high stress levels measured by combination of psychological stress response and job stressors were associated with sickness absence from mental health disorders<sup>29</sup>. High stress levels in the BJSQ, based on recommendation of the stress check program manual, mainly focus on the psychological stress response, rather than job stressors. In a cross-sectional study using the BJSQ, quantitative and qualitative job overload were found positively associated with psychological complaints<sup>30</sup>. The job stressors may not be directly associated with sickness absence due to mental illness, however, they increased workers' psychological complaints or depressive symptoms, which could lead to mental illness, including depression, and then to sickness absence. Whether depressive symptoms mediate associations between the job stressors and sickness absence due to mental illness should be investigated in future studies with a larger sample and long-term follow-up.

We combined teachers, who comprised the majority of professionals in the study population, with managers in a higher occupational status category. Certain factors should be considered here. Teachers in Japan are subjected to higher stress levels than other occupations<sup>31</sup>. Indeed, in 2009–2011, 0.6% of Japanese teachers were suspended from their jobs because of mental disorders<sup>32</sup>. In accordance with such findings, compared with other professions, teachers in the present study scored higher in quantitative and qualitative job overload and physical demands (Appendix). Job stressors may vary among occupations ; in the study sample, when

teachers were compared with other occupations on sickness absence, for whatever reason, there was no significant difference. The small sample may not have permitted us to distinguish the effect teachers' occupational characteristics have on sickness absence. Future studies should address this factor.

The present study had some other limitations. First was the relatively low number of participants and a low response rate for recruitment, despite our efforts to notify candidates. This small sample did not permit us to analyze sex-based differences in the associations between job stressors and sickness absence. Furthermore, an unrepresentative sample of Japanese working men and women could lead to biased results. Participation was also voluntary because the present study was conducted along with a local medical examination provided outside of the workplace. Measured job stressors were not reflective of certain workplace characteristics but rather were individuals' perceived levels. The sample in the present study may contain people especially conscious of their mental health, and/or may be a group at high risk for mental problems. A previous prospective study conducted within a company<sup>11)</sup> found 14 of 1,810 employees developed depression during 1.8 years of follow-up (0.8%); in comparison, the present study had nine sickness absences due to mental illness among the 112 participants, during a mean 2.3 years of follow-up (8.0%). Furthermore, follow-up time differed depending on when a participant was enrolled. Information on sickness absence were obtained by a self-report via postal mail. Care should be taken in interpreting the results because of measurement and recall bias. Other potential confounding factors not considered in the present study should be taken into account for future studies because multiple factors may underlie perceived symptoms and lead to sickness absence.

Despite limitations in the present study, as explained above, we found job stress factors measured by the BJSQ at mental health checkups outside of workplaces were robustly predictive for sickness absence. This study supports the effectiveness of the BJSQ, even though it was measured before the introduction of the stress-check system and was applied for employees in smaller workplaces. Additionally, physical demands were predictive for increased sickness absence owing to whatever reason, after adjusting for potential confounding factors. However, although the associations between job stressor factors and sickness absence due to mental illness were weak, depressive symptoms

were associated with such absence. Physical demands could be improved using workplace interventions, and their implementation could be used to prevent all forms of sickness absence, along with assessment of workers' perceived work-related stress levels.

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### Conflict of interest disclosure

The authors declare that they have no competing interests.

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Appendix. Comparisons between groups by demographic variables in job stress factors

	Manager/Professional ( <i>n</i> = 86)		General workers ( <i>n</i> = 26)		<i>p</i> <sup>#</sup>	Teacher ( <i>n</i> = 68)		Other occupations ( <i>n</i> = 44)		<i>p</i> <sup>#</sup>
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Quantitative job overload	9.4	2.1	8.8	2.0	0.16	9.6	2.1	8.8	2.1	0.047
Qualitative job overload	9.5	1.7	7.9	1.9	0.001	9.6	1.7	8.4	1.9	0.001
Physical demands	2.6	0.8	1.7	0.7	<0.001	2.6	0.8	1.9	0.8	<0.001
Interpersonal conflict	7.1	1.7	7.2	2.0	0.73	7.1	1.5	7.0	2.0	0.76
Poor physical environment	2.6	0.9	2.6	0.9	0.87	2.6	0.9	2.6	0.9	0.99
	Current smoker ( <i>n</i> = 10)		Non-smoker ( <i>n</i> = 102)		<i>p</i> <sup>#</sup>	Current drinker ( <i>n</i> = 57)		Non-drinker ( <i>n</i> = 55)		<i>p</i> <sup>#</sup>
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Quantitative job overload	9.6	2.0	9.3	2.1	0.62	9.5	2.1	9.1	2.2	0.26
Qualitative job overload	9.3	1.1	9.1	1.9	0.73	9.1	1.8	9.1	1.8	0.85
Physical demands	2.5	0.7	2.3	0.9	0.59	2.4	0.9	2.4	0.8	0.94
Interpersonal conflict	8.0	1.5	7.0	1.7	0.081	7.3	1.8	6.9	1.6	0.24
Poor physical environment	2.7	0.8	2.6	0.9	0.69	2.8	0.9	2.4	0.9	0.018
	Physically active ( <i>n</i> = 64)		Non-active ( <i>n</i> = 48)		<i>p</i> <sup>#</sup>	History of diabetes mellitus ( <i>n</i> = 6)		Without diabetes mellitus ( <i>n</i> = 106)		<i>p</i> <sup>#</sup>
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Quantitative job overload	9.1	2.1	9.5	2.1	0.40	9.8	1.5	9.3	2.1	0.52
Qualitative job overload	8.9	2.0	9.4	1.6	0.098	10.0	0.9	9.1	1.9	0.22
Physical demands	2.2	0.8	2.5	0.9	0.051	2.7	0.5	2.3	0.9	0.37
Interpersonal conflict	7.1	1.7	7.0	1.8	0.80	6.3	1.6	7.1	1.7	0.27
Poor physical environment	2.7	0.9	2.5	0.9	0.27	2.5	1.0	2.6	0.9	0.81
	History of hypertension ( <i>n</i> = 14)		Without hypertension ( <i>n</i> = 98)		<i>p</i> <sup>#</sup>	History of hyperlipidemia ( <i>n</i> = 47)		Without hyperlipidemia ( <i>n</i> = 65)		<i>p</i> <sup>#</sup>
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Quantitative job overload	9.1	2.2	9.3	2.1	0.69	9.4	2.2	9.2	2.0	0.75
Qualitative job overload	9.5	1.0	9.1	1.9	0.39	9.2	1.9	9.0	1.8	0.68
Physical demands	2.4	0.9	2.3	0.9	0.74	2.3	0.9	2.4	0.8	0.86
Interpersonal conflict	7.2	1.4	7.1	1.8	0.77	7.1	1.9	7.1	1.6	0.93
Poor physical environment	2.6	0.8	2.6	0.9	0.82	2.6	1.0	2.6	0.9	0.89

<sup>#</sup>*p* values were based on a *t*-test to compare two groups.