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Abstract

Background

Long-term sickness absence due to mental disorders in the workplace is a public health concern. The period of sickness absence due to mental disorders tends to be much longer relative to other diagnoses. Few studies have investigated the period of an extended long-term sickness absence due to mental disorders and the job factors associated with it.

Methods

This study examined differences in job stressors, stress responses, and social support between workers who took extended (≧8 months) and the usual (3-8 months) long-term sickness absence due to mental disorders. Data from responses to the last Brief Job Stress Questionnaire by municipal workers in the Kinki region of Japan before their sickness absence were analyzed for the period between 2011 and 2015. Workers who took long-term sickness absence due to mental disorders were divided into two cohorts (usual or extended long-term sickness absence; 123 individuals each): leave of longer or shorter than eight months (the median leave period). The Brief Job Stress Questionnaire subscales for propensity between the two cohorts were compared using the Mann-Whitney U test.

Results

Workers with extended long-term sickness absence had higher quantitative workloads, poorer physical environments, and less job control, than workers with usual long-term sickness absence.

Conclusions

To reduce long-term sickness absence due to mental disorders, it is necessary to pay particular attention to job stressors and implement appropriate improvements, such as increasing freedom of discretion and reducing the workload.

Key Words: Job stressors; Sickness absence; Mental disorder; Brief Job Stress Questionnaire; Public servant

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Introduction

Sickness absence is a significant public health and economic concern. It not only has a considerable social impact, but also reduces individuals' quality of life. Sickness absence results in a substantial loss of productivity and insurance costs among the working population, and is a critical risk factor for permanent exclusion from the labor market and for disability retirement[1,2]. Reducing and preventing sickness absence is crucial, as it exerts a considerable economic burden on individuals, employers, and society[3].

Mental disorders (MD) among workers are a global concern. In Japan, over 60% of workers have reportedly experienced intense occupational worry or stress[4], and 32% of Japanese companies have shown a growing number of employees who exhibit mental health problems[5]. The Japanese Ministry of Health, Labour and Welfare reported that in approximately 10% of all companies, employees are taking a sickness absence of over a month or quitting their jobs due to MD[6]. It has been the second largest cause of sickness absence in Japan. In Finland, an increase in sickness absence due to MD was observed between 2016 and 2019 in all age groups of both genders[7,8]. Both changing and persistent common mental disorders at the two time points, which were separated by five years, elevated the risk of sickness absence due to MD, as well as all-cause sickness absence[9]. Additionally, sickness absence due to MD has increased in a number of countries in recent times[10,11].

The period of sickness absence due to MD tends to be longer concerning other diagnoses resulting in absence, such as musculoskeletal diseases[12-15]. In Japan, MD are the most common causes of long-term sickness absence (LTSA), followed by cancer, with both accounting for more than half of all LTSAs[16]. A study in the UK found that MD, largely neurosis and neurosis ill-defined, was the second largest cause of long periods of sickness absence (>21 days), accounting for 16% of absences among men and 18% among women[17]. On the other hand, study of employees in a Japanese manufacturing company reported on their sickness absence days due to MD[18]; the mean sickness absence period was 330.2 days for major depressive disorder, 237.8 days for adjustment disorder, and 506.2 days for anxiety disorders. In the Japanese workforce, as of 1997, the average length of absence due to MD and non-MD were 119.5 and 47.3 days, respectively[12]. As shown above, MD tend to have longer periods of sickness absence from work than non-MD in Japan.

Public service jobs, including typical jobs in various fields such as general affairs, accounting, personnel affairs, and taxes, are among the most popular in Japan. We presumed these to represent typical work in the country. Japanese public servants with sickness absence are provided sufficient welfare benefits, such as being paid a part of their wages. This may permit ease of taking sickness absence. Additionally, in comparison to private sector workers, public servants often work under uniform conditions, including having high education levels, stable wages, and guaranteed job stability with no threat of unemployment until retirement[19,20]. Because of these benefits, public servants may tend to take long sickness absences without being able to return to work early. The Japan National Personnel Authority[21] in 2017 reported that the most frequent reason given (65.5%) for sickness absence lasting over one month was "Mental and behavioral disorders" among public servants. Another survey by the Japan Local Government Employee Safety and Health Association[22], examined 760000 local public servants in 2018 and found that 2551 per 100000 public servants took more than one month of sickness absence; the most frequent reason given for sickness absence was "Mental and behavioral disorders" accounting for 57.7% of the absence lasting more than one month. This rate is continually increasing.

Several studies have reported factors associated with prolonged periods of sickness absence. A longitudinal study in Germany demonstrated a prospective association between high job strain and LTSA (>6 weeks)[23]. A longitudinal cohort study in Norway among 543 sick listed employees revealed that low decision control as well as psychologically demanding jobs were independent predictors of delayed return to work[24]. In Japan, diagnosis and employee rank were factors predicting the duration of sickness absence due to MD[25].

A meta-analysis has shown that exposure to psychosocial stressors at work was associated with an increased risk of a varied duration of sickness absence due to mental disorders[26]. However, few studies have investigated the association between an extended LTSA due to MD and job stressors and focused on very long-term sickness absences among public servants. According to the job stress model proposed by the National Institute for Occupational Safety and Health, job stressors bring acute stress responses, or strains, to workers. Such short-term strains, in turn, are presumed to have an impact on longer-term indicators of mental and physical health, such as sickness absences[27]. Therefore, we hypothesize that workers with extended LTSA due to MD experience much higher job stressors than the workers with usual LTSA-MD among public servants. We conducted a study on the differences in job stressors between the shorter and longer leave periods among LTSA-MD workers.

Methods

Participants

Public servants working for the municipal or ward office of City A in the Kinki region of Japan answered the Brief Job Stress Questionnaire (BJSQ) as a part of the annual Stress Check Program[28]. The Japanese government launched this occupational health policy with approximately 50 employees in 2015, to screen workers with high psychosocial stress in the workplace. We requested the municipal office of City A for a list of workers who took a sickness absence of 90 days or more between 2011 and 2015 in the city, and for the BJSQ data collected immediately before their leave. Both absence data and BJSQ data were anonymized by the office staff before the acquisition. Figure 1 shows an inclusion-exclusion flowchart. Of the 810 workers who took long-term leave of 90 days or more, the following employees were excluded: 216 who provided incomplete responses, 161 who took leave for reasons other than MD, and 99 who retired whilst on leave. A total of 334 workers who had MD and provided complete answers on their last BJSQ before taking sickness absence, were analyzed in this study.

The median sickness absence period for all participants was eight months. Participants were divided into two cohorts based on their sickness absence period: eight months or longer (extended LTSA) and less than eight months (usual LTSA). The presence of overcontrol bias due to common method variance was tested using Harman's single-factor test.

Ethics statement

The Human Subjects Review Committee at Osaka City University approved the protocol of this study (authorization number: 3337). As the data already existed, the review committee did not require written informed consent. We obtained the BJSQ data of the workers anonymously (with encrypted ID). The health care center of City "A" provided a list of workers who took LTSA annually for a mental health checkup and evaluated and improved the psychological work environment.

Long-term sickness absence due to mental disorders

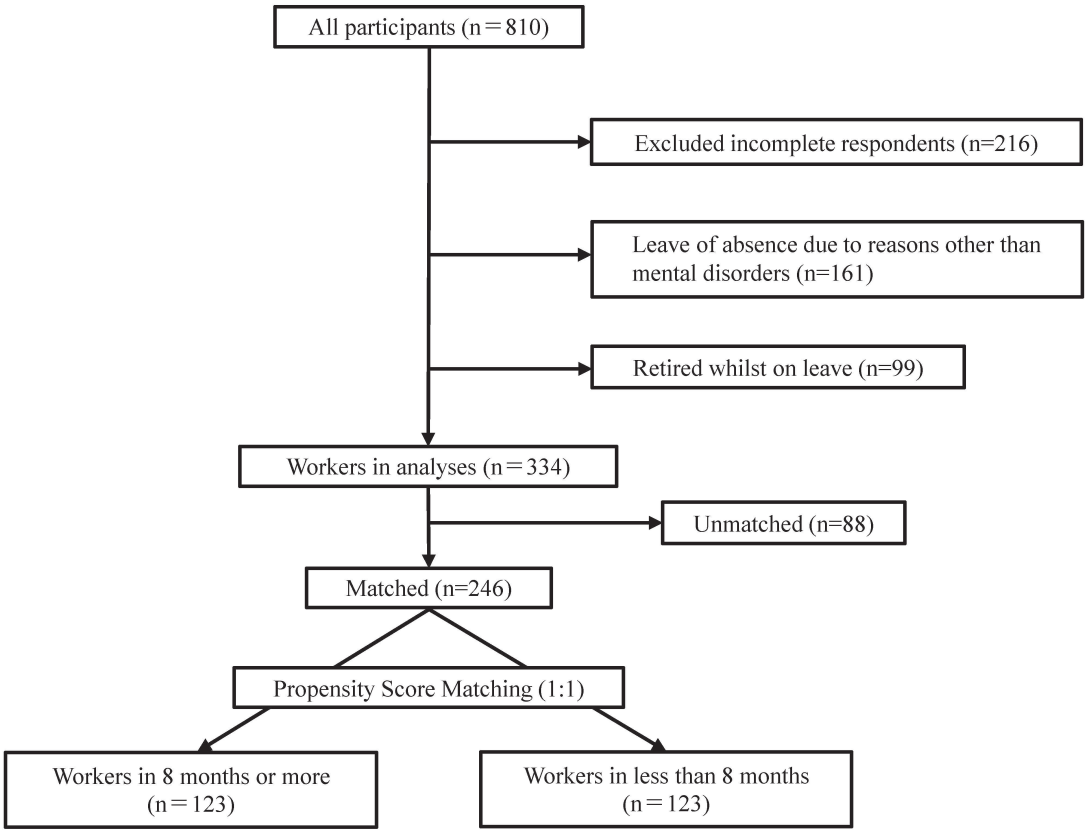

Figure 1. Flow chart for the selected study population.

LTSA-MD is defined as MD related sickness absence for greater than 90 days. The reason for LTSA-MD was confirmed using a medical certificate issued by a doctor. The diagnoses on these certificates are not necessarily based on the International Classification of Diseases, Tenth Revision (ICD-10)[29]. The medical certificate for each LTSA in this study was confirmed by the researchers/issuing doctors with over 10 years' experience, who diagnosed and classified MD (F code) that resulted in the LTSA-MD. The medical certificates occasionally had two or more diagnoses. In such cases, if the multiple diagnoses were from a single ICD-10 category, they were classified into that category. If the multiple diagnoses belonged to different categories, we classified them into the category of causal disease (Priority order; F0, F1, F7, F8, and F9>F6>F2 and F3>F4 and F5).

Brief Job Stress Questionnaire

The BJSQ utilized questions from the Job Content Questionnaire and Generic Job Stress Questionnaire, which were developed by the National Institute for Occupational Safety and Health. A large-scale investigation among Japanese workers confirmed the questionnaire's validity and reliability[30]. The BJSQ evaluated 57 items on a four-point Likert scale, ranging from 1 (disagree) to 4 (agree). The items were grouped into scales of: job stressors (17 items), stress responses (29 items), social support (9 items), and work and life satisfaction (2 items). Job stressors represented psychological stressors related to work, and comprise quantitative workload, qualitative workload, physical demands, interpersonal conflict, poor physical environment, job control, skill utilization, suitable jobs, and meaningfulness of work subscales. Stress responses represented psychological and physiological stress reactions and consist of vigor, irritability, fatigue, anxiety, depression, and

physical stress response subscales. Social support represented social support in the workplace and comprised support from supervisors, from coworkers, and from family/friends subscales. Higher scores on each BJSQ subscale indicated higher levels of stress. Average scores were calculated for each subscale by dividing the total scores by the number of items for each subscale.

Demographic and occupational variables

Gender and age were the demographic variables, whereas job rank (manager/chief/staff) and job categories (clerical, technical, professional) were the occupational variables.

Statistical analysis

Propensity score matching was used for the two groups to minimize bias due to confounding factors, such as the diagnosis that led to the leave, the period from the administration of BJSQ to the start of the sickness absence, and background factors. The propensity score was calculated by logistic regression analysis using the period in which the participants took LTSA. Extended and usual LTSA were the dependent variables, whereas age, gender, position, occupation type, diagnosis resulting in sickness absence, and the period from the time they answered BJSQ to the start of LTSA, were independent variables.

Matching was performed by nearest-neighbor, with one non-restoration extraction with the caliper of $\times 0.2$ as the standard deviation of the propensity score. Chi-square tests were performed to compare the number of participants classified before and after propensity score matching for each subscale of the BJSQ in the two groups.

Between-group comparisons were performed using the Mann-Whitney U test, as the data were not normally distributed. A value of $p < 0.05$ was regarded as a statistically significant difference between groups. The data were analyzed using IBM SPSS version 26 (IBM, USA).

Results

Participant characteristics

Of the 334 study participants, 237 were men (71%) and 97 were women (29%). The mean age ± standard deviation (SD) was 41.9±7.8 years. A total of 136 employees were in the usual LTSA group and 198 were in the extended LTSA group before propensity score matching. Among all participants, the most frequent ICD-10 codes diagnosed for LTSA-MD were F3 (mood disorders; N=226, 67.7%), followed by F4 (stress-related and somatoform disorders; N=86, 25.7%). The remaining workers in the cohort (6.6%) were diagnosed under codes F0 (organic, including symptomatic, mental disorders), F1 (mental and behavioral disorders due to psychoactive substance use), F2 (schizophrenia, schizotypal and delusional disorders), F8 (disorders of psychological development), or F9 (behavioral and emotional disorders with onset usually occurring in childhood and adolescence). The demographic and occupational characteristics of the pre-matched and matched participants in the usual and extended LTSA groups are summarized in Table 1, respectively. In the cohort with usual LTSA, after matching, there were 101 men and 22 women, with a mean age±SD of 42.4±7.7. In the cohort with extended LTSA, there were 103 men and 20 women, with a mean age±SD of 42.8±7.0. After propensity score matching, no significant differences were found for diagnosis, gender, age, position, and job category between the two LTSA groups.

Comparison of BJSQ subscales between shorter and longer LTSA

For Harman's single-factor test, the largest factor did not account for a majority of the variance (26.6%), indicating that overcontrol bias due to common method variance was not of great concern.

Table 1. Demographic and occupational characteristics before and after propensity score matching

	Before matching (n=334)		After matching (n=246)	
	Usual LTSA	Extended LTSA	Usual LTSA	Extended LTSA
Period of sickness absence (months), mean±SD	5.9±1.6	17.5±8.6	5.9±1.6	17.7±8.7
N	136	198	123	123
ICD-10 code				
F3	106 (77.9%)	120 (60.6%)	93 (75.6%)	92 (74.8%)
F4	24 (17.7%)	62 (31.3%)	24 (19.5%)	24 (19.5%)
Other mental disorders	6 (4.4%)	16 (8.1%)	6 (4.9%)	7 (5.7%)
Gender (men:women)	114:22	123:75	101:22	103:20
Age	42.4±8.0	41.7±7.6	42.4±7.7	42.8±7.0
Position (job title)				
Manager	15	25	13	16
Chief	13	34	13	14
Staff	108	139	97	93
Job category				
Clerical worker	97	137	89	92
Technical worker	26	35	23	21
Professional worker	13	26	11	10

LTSA, Long-term sickness absence; and ICD-10, The International Classification of Diseases, Tenth Revision.

The BJSQ subscale scores in the usual and extended LTSA groups are summarized in Table 2. Workers in the extended LTSA group showed a more significant quantitative workload, poorer physical environment, and less job control among job stressors compared with workers with usual LTSA. No significant differences were found for the remaining subscales. In addition, there were no significant differences for the subscales of the stress response, social support, and satisfaction.

Discussion

This study divided the participants into two groups (usual and extended LTSA-MD) based on the period of their sickness absence and compared the scores of the scales of job stressors, stress response, and social support. The results revealed that workers with extended LTSA-MD had a more significant quantitative workload, poorer physical environments, and less job control. There were no significant differences for other job stressors, stress response, social support, and satisfaction with the length of sickness absence.

This study hypothesized that greater job stressors prolonged the period of sickness absence, which was partly supported by our findings. It demonstrated that a greater quantitative workload and lower job control were correlated with a longer period of sickness absence, which followed the job demand control model developed by Karasek[31]. According to this model, a combination of high job demands and low job control, referred to as high job strain, predicts adverse health effects. The findings of this study were largely consistent with the model in terms of workload and job control. The meta-analysis on the risk of sickness absences due to mental disorders (not limited to long-term) showed that exposure to job strain elevated the risk of sickness absences by 47%[26]. Some aforementioned longitudinal studies reported the association between high job strain and LTSA[23,24]. Particularly, Norwegian employees who report high levels of job strain are at an increased risk of

Table 2. Subscale scores on the Brief Job Stress Questionnaire

	Range	Usual LTSA	Extended LTSA	p-value
Job stressor				
Quantitative workload	3-12	7.8±2.4	8.8±2.3	0.01*
Qualitative workload	3-12	8.6±2.2	9.0±2.1	0.20
Physical demands	1-4	1.9±1.0	2.1±1.1	0.07
Interpersonal conflict	3-12	6.4±1.8	6.5±2.0	0.55
Poor physical environment	1-4	2.4±1.0	2.7±1.0	0.03*
Lack of job control	3-12	8.0±2.2	8.5±2.0	0.03*
Skill utilization	1-4	2.6±0.8	2.5±0.9	0.45
Suitable jobs	1-4	2.8±0.9	2.8±0.9	0.72
Meaningfulness of work	1-4	2.6±0.9	2.6±0.9	0.62
Stress response				
Vigor	3-12	9.8±2.0	9.8±2.3	0.84
Irritability	3-12	6.5±2.7	6.5±2.5	0.95
Fatigue	3-12	7.8±2.7	8.3±2.9	0.11
Anxiety	3-12	7.3±2.9	7.8±2.9	0.23
Depression	6–24	12.8±5.0	13.4±5.0	0.36
Physical stress response	11-44	22.0±6.9	23.0±6.9	0.25
Social support				
Support from supervisor	3-12	7.8±2.3	7.8±2.0	0.77
Support from coworker	3-12	7.7±2.3	7.8±2.2	0.69
Support from family/friends	3-12	5.8±2.6	5.8±2.5	0.55
Other factors				
Job satisfaction	2-8	5.0±1.5	4.9±1.5	0.53

Each score is expressed as mean±standard deviation. *Denotes a significant difference in scores between the usual and extended LTSA cohorts ($p<0.05$). LTSA, Long-term sickness absence.

LTSA (>16 days)[32]. Several studies also focused on the association between the period of LTSA and job factors. A one-year follow-up study in Belgium reported a significant indirect association between job strain-mediated bullying and LTSA (>15 consecutive days)[33]. Our results were consistent with the findings of these studies on the association between job strain and LTSA. Milner et al found contemporaneous associations between various work stressors and mental health, while only job demands (consistent with quantitative workload, qualitative workload, physical demands, interpersonal conflict, and poor physical environment in the BJSQ) had a lagged effect on mental health one year later[34]. This lagged effect may explain the reason for the extended LTSA-MD.

However, there was no significant difference between usual and extended LTSA with regard to social support. The demand-control-support model states that social support acts as a buffer against the negative impact of a more significant strain on workers[35]. Furthermore, according to the National Institute for Occupational Safety and Health in Japan, social support acts as a buffer to control stress responses in the workplace and illness caused by stress[36]. Interestingly, not only physical workload but also social support from colleagues have been associated with the length of sickness absence[37]. Moreover, low psychological job demands, high social support from coworkers, supervisor support (Odds Raito; OR=3.4, 95% Confidence Interval; CI: 1.6-7.3), and low strain (low job demands and high control) were predictive of shorter periods before returning to work after absence[38]. A comparative study showed that the combination of high job strain and low social support at work was

associated with sickness absences due to mental disorders for more than 15 days[39]. Our results are not consistent with these findings. Some studies have reported that social support has little correlation with long-term leave. For instance, a study in Belgium in 2004 did not find any effect of social support on LTSA due to mental health problems[40]. The meta-analysis mentioned above showed that the association between low social support at work and a risk of sickness absence was found; however, it is not statistically significant[26]. Similarly, a study in the Republic of Slovenia indicated that workplace support from coworkers and leaders was not associated with the period of sickness absence in understanding the influencing factors of LTSA-MD[41]; therefore, the associations of social support with LTSA remain unclear.

In contrast to this study, previous studies focused on LTSA not only due to MD but also somatic disorders (not LTSA-MD); moreover, the boundary between short- and long-term absences varied in each study, ranging between six weeks and three months[42]. This boundary range is remarkably shorter than that considered in this study (eight months). To date, no research has attempted to examine LTSA-MD of such length.

We used job stressors data before the workers' sickness absence. The data included prolonged stressful periods experienced by workers before extended LTSA-MD. These factors are predicted to be higher in extended LTSA-MD (quantitative workload, poor physical environment, and low job control) than the usual LTSA-MD and have extended long-lasting effects. We assumed that the factors that were not different between extended and usual LTSA-MD (social support) do not have major long-lasting effects. Our results also showed that almost all other BJSQ subscales did not show the differences between extended and usual LTSA. We assume these factors similarly do not have major long-lasting effects. Kristel et al reported that workers with subjective health complaints do not differ from the reference group concerning return-to-work predictors from long-term sickness absences[43]. This is in line with the results of stress responses, which did not differ between usual and extended LTSA in this study. By contrast, a Hordaland study reported that anxiety and depression were stronger predictors of a longer duration of sickness absences[44]. However, the longest sickness absence duration used in the study was more than 90 days. It is significantly shorter than the duration we used in our study. The results of the present study are significant for understanding extended LTSA-MD, as MD often induces long periods of sickness absences.

Our study also showed that workers with extended LTSA-MD worked in a significantly poorer physical environment than usual LTSA-MD workers. In the BJSQ, a poor physical environment means, "The environment of your workplace (noise, light, humidity, and ventilation) is not so good"[30]. We found no studies focusing on the association between poor work environment and the period of sickness absence. Fletcher et al found effects for lagged environmental work stressors on health over a five-year period, with these stressors contributing to a sustained decline in worker health[45]. These findings are consistent with our results. We presume that the workers in the poor physical environmental workplace are demotivated to return to work earlier. Our results can explain the long-lasting effect of poor physical environment in the workplace and hesitation to return to work. As mentioned above, Japanese public servants are provided with sufficient financial support and benefits during leaves of absence. These may be contributing factors as to why a worker may maintain a long leave of absence.

Meta-analysis revealed that, compared to the control group, clinical or work-focused interventions aimed at improving return to work reduced the number of sickness absence days in the intervention

group[46].

This study had several strengths. First, the defined period of sickness absence was much longer than in most other studies. To the best of our knowledge, few studies have focused on sickness absence for more than eight months. Second, this investigation was a nested case-control study, allowing the evaluation of temporal causal relationships with a control cohort to increase the robustness of our evaluations. Third, participants were selected from about 20000 employees ×5 years, who belong to a single large workplace. Therefore, compared to other studies that gathered participants from multiple companies, there is less variation in work content and occupations; it is thought that the bias by company unit is also less. Fourth, we used propensity score matching method to reduce the bias from the time separation between the period participants answered BJSQ and the end of sickness absence. Because it is difficult to require answering questionnaire, such as job stressors, during sickness absence in general, we could obtain data before the sickness absence. Further, no other study used propensity scores to compare sickness absence periods. Fifth, the diagnosis, which constituted the reason for the employees' absence, were objectively confirmed mental disorders by psychiatrists rather than being subjectively measured (e.g., through a mental health questionnaire).

On the other hand, this study encountered the following limitations. First, data were obtained only from public servants from a single city in Japan, making it difficult to generalize the findings to other jobs and locations. Second, the BJSQ was collected before their period of absence. However, their responses may have altered during the leave; because such information could not be obtained, these possibilities remain ambiguous. Third, past MD or comorbidities could not be determined, as participants' medical certificates identified only the present disease. Fourth, differences in specific roles within a worker's occupation were not considered; work atmosphere and content may further affect workers' job stressors. Fifth, the frequency of sickness absence could not be considered. Sixth, in this study, it is difficult to predict the period of sickness absence for those who retired whilst on leave. Therefore, we excluded them, but it is possible that this underestimates or overestimates the impact of job stressors on extended LTSA. Finally, all data were self-reported; as such, personality differences or response tendencies may have influenced the results. Further research using methods to measure workers' stress through objective investigations, such as semi-structured interviews, is required.

Conclusions

Our findings showed that workers who took extended LTSA-MD for more than eight months had a more significant quantitative workload, poorer physical environments, and less job control. Mitigating lost time and productivity by monitoring workers' stress levels, and identifying and intervening when workplace stress is exceptionally high, could serve as a possible solution to mitigate LTSA-MD.

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