

Title: Health effects of weekend work on Korean workers: based on the 6th Korean Working Conditions Survey

Running title: Association between weekend work and health

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Abstract

Background: Although weekend work makes up a significant part of work patterns in modern society, research on the health effects of weekend work is relatively limited compared to other types of non-standard work. This study was conducted to examine the impact of weekend work on the health of Korean workers, aiming to provide evidence to support the development of welfare policies that promote workers' health.

Methods: This study was conducted using data from the 6th Korean Working Conditions Survey, targeting 35,957 Korean workers who met the research criteria. Based on the survey responses, information was collected on weekend work status and health outcomes, including general health, musculoskeletal pain, headaches or eye pain, fatigue, sleep disorders, depression, anxiety, absenteeism and presenteeism. To examine the association between weekend work and health outcome variables, logistic regression analysis was performed adjusting for sociodemographic and occupational characteristics, with additional stratified analyses conducted according to employment status.

Results: Among the final study population, 11,255 workers, accounting for 30.48% of the total, were weekend workers. After adjusting for sociodemographic and occupational characteristics, weekend work was found to be significantly associated with depression (OR 1.08, 95% CI 1.00-1.18), anxiety (OR 1.35, 95% CI 1.16-1.58), musculoskeletal pain (OR 1.45, 95% CI 1.34-1.58), fatigue (OR 1.49, 95% CI 1.36-1.62), absenteeism (OR 1.70, 95% CI 1.43-2.03), and presenteeism (OR 1.82, 95% CI 1.62-2.04). The health effects of weekend work differed between the self-employed and employees, as shown in the results of the stratified analysis.

Conclusions: Weekend work was found to increase the risk of both physical and mental health problems of Korean workers, and the effect varied according to employment status. There is a need to design a comprehensive occupational health policy that reflects the characteristics of different

employment statuses.

Keywords: weekend work; KWCS; health effect; employment status

BACKGROUND

Labor regulations in many countries have been restructured to strengthen workers' rights, including the implementation of statutory limits on weekly working hours. As a result, the five-day workweek has become the normative standard across most industrialized economies. Nevertheless, nonstandard work schedules—particularly weekend work—remain a persistent and substantial feature of contemporary labor markets. In the United States, approximately 29% of employees reported working on weekends in 2022¹. In Europe, the prevalence averaged 25% in 2023, with notable cross-national variation². In Australia, nearly 30% of the workforce engaged in weekend work during the same period³. In South Korea, the prevalence is even higher; as of 2020, 42.9% of workers reported working on Saturdays and 20.3% on Sundays^{4,5}, underscoring the widespread nature of weekend labor even under formal labor protections.

Weekend work is increasingly recognized as a socially embedded labor pattern, particularly in service-oriented, retail, and self-employment sectors that demand temporal flexibility⁶. As labor markets shift toward deregulation and flexible scheduling, a growing number of workers are routinely assigned to or voluntarily engage in weekend shifts⁷. However, this nonstandard schedule challenges conventional temporal boundaries between work and personal life, and is associated with a range of psychosocial and behavioral disruptions, including work-life conflict, reduced recovery time, and social disconnection^{8,9}.

Emerging empirical evidence supports these concerns, indicating that weekend work may adversely affect workers' health through both physiological and psychological pathways. Jamal (2004) found that employees working weekends experienced significantly higher levels of emotional exhaustion, job stress, and psychosomatic symptoms compared to their weekday-only counterparts¹⁰. Similarly, Davis et al. (2008) observed elevated job strain among office workers engaged in weekend

shifts¹¹. A population-based study in Japan further demonstrated that weekend work was strongly associated with poor mental health outcomes, with each additional hour of weekend labor exerting disproportionately greater psychological impact than equivalent weekday hours¹².

Despite these findings, epidemiological evidence on the direct health consequences of weekend work remains limited and inconclusive. Moreover, little attention has been paid to how these health risks may differ by employment type—a potentially critical determinant of occupational vulnerability. Employment status fundamentally influences the degree of autonomy over work schedules, exposure to job-related stressors, and access to social protection¹³. Self-employed workers may enjoy greater temporal flexibility but often face heightened economic insecurity and longer working hours^{14,15}. In contrast, employees are typically subject to fixed schedules and limited control, which may also contribute to work-related stress¹⁶. These structural differences suggest that the health implications of weekend work are unlikely to be uniform across employment categories, highlighting the importance of disaggregated analysis.

In the South Korean context, where weekend work remains prevalent yet underexamined, there is a pressing need to clarify the health implications of this nonstandard work arrangement. The present study addresses this gap by investigating the associations between weekend work and multiple dimensions of health—including general, psychological, and physical health—using a nationally representative dataset. In addition, we examine whether these associations differ by employment status (self-employment vs. wage employment), thereby contributing novel insights into occupational health inequities in the context of nonstandard labor.

METHODS

Data source and study population

This study was designed as a population-based, cross-sectional analysis, utilizing data from the 6th Korean Working Conditions Survey (KWCS). First launched in 2006, the KWCS is a nationwide survey targeting workers aged 15 and older who are engaged in economic activity in South Korea. The primary objects of the survey is to assess a broad range of employment and working conditions that may affect

occupational safety and health. The 6th KWCS was conducted between October 5, 2020, and April 11, 2021.

Figure 1 shows the sample selection process of our study. Of the 50,538 individuals originally surveyed, 1,605 unpaid family workers were excluded from the analysis. To isolate the effect of weekend work, an additional 12,290 individuals were excluded due to engagement in other forms of nonstandard work schedules – specifically, long working hours (defined as more than 52 hours per week), night work, or shift work – which may confound the health outcomes of interest. Furthermore, 686 respondents with missing data on key variables, such as weekend work status and health outcomes, were also excluded. After these exclusions, the final analytic sample comprised 35,957 participants. To assess data completeness, we calculated the response rate for each variable. To examine potential selection bias, we conducted chi-square tests to compare the characteristics of the included and excluded groups.

Definition of variables

The main exposure variable in this study was weekend work status. This was defined based on participants' responses to the question: "How many days per month do you work in the following categories?". If participants responded "None" to both "Saturday work" and "Sunday work", they were classified as "non-weekend workers." If they reported working on or more days on either day, they were categorized as "weekend workers."

Nine health-related variables were adopted as outcome variables. General health status was assessed using the question: "How would you describe your overall health?" Participants who answered "very poor" or "poor" were categorized as having "poor" general health, while those who answered "very good," "good," or "fair" were categorized as having "good" general health.

The risk of sleep disorders was assessed using the Minimal Insomnia Symptom Scale (MISS). Participants were asked: "In the past year, how often have you experienced the following sleep-related problems?" Each of the three sub-items (A, B, and C) was scored from 0 to 4, the total score was calculated. A total score of 6 or more indicated a "high" risk of insomnia¹⁷. Depression was assessed

using the World Health Organization Well-Being Index (WHO-5), based on responses to the question: “In the past two weeks, how often have you experienced the following feelings?” Each item was rated on a 6-point scale (1-6), and scores for five sub-items were summed. The total score was then multiplied by 4. A final score of 50 or less indicated a high risk of depression¹⁸. Anxiety, and headaches or eye pain, and general fatigue were assessed with the question: “In the past year, have you experienced any of the following health issues?” Participants who answered “yes” were classified as having a “high” risk for each respective condition. Musculoskeletal pain was also measured using the same question. Participants were asked whether they had experienced pain in any of three regions: (A) back, (B) upper limbs, or (C) lower limbs. Those who reported at least one of these were classified as having a “high” risk of musculoskeletal pain.

To assess absenteeism due to health problems, participants were asked: “In the past year, how many days have you missed due to health-related issues?” Respondents who answered “1 day or more” were considered to have experienced absenteeism. Presenteeism, defined as attending work despite health problems, was assessed with the question: “In the past year, have you gone to workplace while feeling unhealthy?” Those who answered “yes” were categorized as having experienced presenteeism.

To control for potential confounders, sociodemographic and occupational characteristics were included as covariates. Sociodemographic variables included gender (male or female), age (15–29, 30–39, 40–49, 50–59, or ≥ 60 years), educational attainment (below college or college graduate) and monthly income level (< 2,000,000 KRW; 2,000,000–2,999,999; 3,000,000–3,999,999; or $\geq 4,000,000$ KRW). Occupational variables included employment status and weekly working hours. Employment status was classified into self-employed and employees. Weekly working hours were grouped into < 40 hours and ≥ 40 hours, based on the Korean Labor Standards Act, which stipulates a 40-hour workweek as the legal maximum.

Statistical analysis

Descriptive analyses were conducted to examine the distribution of participants’ sociodemographic characteristics, occupational characteristics, and health outcomes according to weekend work status.

Difference between weekend workers and non-weekend workers were assessed using Chi-square tests for categorical variables.

To evaluate the association between weekend work and each health-related outcome, logistic regression analyses were performed. Two models were specified: a Crude model, in which no covariate were adjusted, and an Adjusted model, which controlled for sociodemographic characteristics (gender, age, educational attainment, and monthly income) and occupational factors (employment status and weekly working hours). For each outcome, odds ratios (ORs) and 95% confidence interval (CI) were estimated for weekend workers compared to non-weekend workers. Furthermore, to explore potential effect modification by employment status, stratified logistic regression analyses were conducted separately for self-employed individuals and employees. This approach enabled the assessment of whether the association between weekend work and health outcomes differed meaningfully between these two occupational groups. To assess the robustness of our findings, we conducted a sensitivity analysis by excluding workers who reported working six or seven days per week. This allowed us to examine whether the observed health effects of weekend work persisted after reducing the potential confounding influence of total weekly workdays.

All analyses incorporated individual-level sampling weights provided by the 6th KWCS, which were calibrated using the March 2021 Economically Active Population Survey to ensure national representativeness. Statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA), and a two-tailed p-value < 0.05 was considered indicative of statistical significance.

Ethics statement

Institutional Review Board (IRB) of Seoul National University Hospital determined to exempt the review of this study and approved the waiver of written informed consent due to the secondary use of anonymous information (IRB No. E-2208-111-1351).

RESULTS

Before presenting the main results, Supplementary Table 1 shows the variable-specific

response rates for health variables with missing data due to non-response. A comparison of characteristics between the excluded group and the study population can be found in Supplementary Table 2. Chi-square test results showed significant differences between the study population and the excluded group in terms of gender, status of employment, and working hours, while no significant differences were found for the other variables.

Table 1 shows participants' sociodemographic and occupational characteristics by weekend work status. Among the final analytic sample of 36,920 participants after applying the weights, 11,255 workers (30.48%) reported working on weekend. Overall, 55.79% of participants were male and 44.21% were female. Among weekend workers, the proportion of males was notably higher at 60.09%, compared to 39.91% for females. With respect to age, the 50-59 age group accounted for the largest share of weekend workers (24.88%), whereas the 15-29 age group represented the smallest proportion (15.20%). In terms of educational attainment, weekend workers were more likely to have an educational level below college (55.49%) compared to non-weekend workers (37.73%). For income, the most common category for both groups was less than 2 million KRW per month. Regarding occupational characteristics, weekend workers had a markedly higher proportion of self-employed individuals (31.27%) compared to non-weekend workers (10.40%). Additionally, a slightly higher proportion of weekend workers (26.68%) reported working less than 40 hours per week compared to non-weekend workers (24.45%). All sociodemographic and occupational variables differed significantly between weekend and non-weekend workers ($p < 0.05$).

Table 2 summarizes the distribution of health outcomes by weekend work status. Weekend workers exhibited significantly higher prevalence rates of poor general health, psychological distress (including depression and anxiety), absenteeism due to illness, and presenteeism compared to their non-weekend counterparts. For physical health conditions, the prevalence of musculoskeletal pain and fatigue was also significantly elevated among weekend workers.

Table 3 shows the results of logistic regression analyses assessing the association between weekend work and various health-related outcomes. In the crude model, weekend work showed significant associations with all health indicators examined in this study. After adjusting for

sociodemographic and occupational covariates, weekend work remained significantly associated with depression (OR : 1.08, 95% CI : 1.00-1.18), anxiety (OR : 1.35, 95% CI : 1.16-1.58), musculoskeletal pain (OR : 1.45, 95% CI : 1.34-1.58), fatigue (OR : 1.49, 95% CI : 1.36-1.62), absenteeism due to illness (OR : 1.70, 95% CI : 1.43-2.03), and presenteeism (OR : 1.82, 95% CI : 1.62-2.04). No statistically significant associations were observed for general health, sleep disorder, headaches or eye pain after covariate adjustment.

Table 4 shows the stratified analyses by employment status (self-employed vs. employees) to explore potential differences in the health impacts of weekend work. Among the self-employed, weekend work was significantly associated with musculoskeletal pain (OR : 1.47, 95% CI : 1.24-1.73), fatigue (OR : 1.37, 95% CI : 1.15-1.63), absenteeism (OR : 2.34, 95% CI : 1.58-3.46), and presenteeism (OR : 2.20, 95% CI : 1.71-2.84), but not with depression or anxiety. In contrast, among employees, weekend work was significantly associated with depression (OR : 1.11, 95% CI : 1.01-1.22), anxiety (OR : 1.40, 95% CI : 1.17-1.68), musculoskeletal pain (OR : 1.45, 95% CI : 1.32-1.59), fatigue (OR : 1.52, 95% CI : 1.38-1.67), absenteeism (OR : 1.59, 95% CI : 1.30-1.94), and presenteeism (OR : 1.75, 95% CI : 1.54-1.99). Notably, the odds for fatigue was higher among employees, whereas musculoskeletal pain, absenteeism, and presenteeism exhibited stronger associations among the self-employed. No significant associations were found for general health, sleep disorders, headaches or eye pain in either employment group.

The results of the sensitivity analysis are presented in Supplementary Table 3. Similar to the primary analysis, weekend work remained significantly associated with depression, anxiety, musculoskeletal pain, fatigue, absenteeism, and presenteeism even after excluding workers who worked 6 or 7 days per week.

DISCUSSION

In this nationally representative cohort, nearly 30% of economically active individuals reported working on weekends-a strikingly high prevalence that reflects the evolving dynamics of modern labor markets. Weekend workers were socioeconomically disadvantaged, characterized by

lower educational attainment, reduced income levels, and a substantially higher rate of self-employment. Beyond these structural disparities, weekend work was significantly associated with a broad spectrum of adverse health outcomes. After controlling for sociodemographic and occupational covariates, weekend workers exhibited elevated risk of fatigue, musculoskeletal pain, absenteeism, and presenteeism, as well as poorer mental health profiles, including higher odds ratio of depression and anxiety. These findings suggest that weekend work may serve not merely as a marker of labor precarity, but as an independent determinant of physical and psychological morbidity. The results of the sensitivity analysis, excluding workers who worked 6 or 7 days per week, were largely consistent with those of the main analysis, demonstrating the robustness of our findings.

Our findings are broadly consistent with prior research conducted in Europe and other developed countries, which have consistently demonstrated the health risks associated with weekend work. For example, studies based on the European Working Conditions Survey (e.g., Wirtz et al., 2011; Greubel et al., 2016) have found that workers engaged in weekend shifts are more likely to experience occupational accidents—likely due to disrupted work-rest cycles, cumulative fatigue, and reduced staffing during weekends^{19,20}. Other studies have shown that weekend workers tend to engage in lower levels of physical activity and higher alcohol consumption, lifestyle factors that can further exacerbate physical health risks²¹. Together, these patterns suggest that weekend work may contribute to a cumulative physiological burden, elevating the risk for both acute injuries and chronic conditions.

In addition to physical health concerns, the psychological burden of weekend work has been widely documented. Weston et al. (2019) identified a strong association between weekend work and depressive symptoms²². A key mechanism appears to be the erosion of work-life balance, as highlighted in earlier work by Wirtz et al. and Greubel et al., which limits opportunities for recovery and increases emotional strain^{19,20}. Moreover, weekend shifts often interfere with time spent with family and social networks, as shown in studies by Bittman (2005) and Laß & Wooden (2022), further contributing to stress, social isolation, and relational conflict—all of which are linked to poor mental health outcomes^{23,24,25}.

Weekend work was also significantly associated with elevated levels of both absenteeism and

presenteeism. These dual outcomes were particularly pronounced among self-employed workers, who may face competing pressures: a strong sense of financial and personal responsibility that drives them to work while ill, and greater flexibility that permits time off when necessary^{26,27}. By contrast, employees may be constrained by a lack of paid sick leave or workplace culture discouraging absence, resulting in suppressed absenteeism and potentially higher presenteeism. This interpretation aligns with cross-national evidence; in countries like Germany, where paid sick leave is guaranteed, wage workers report higher absenteeism, whereas in South Korea, the absence of such protections may lead to greater presenteeism²⁸.

These observed disparities can be further understood through Karasek's Job Demand–Control model^{29,30}. Self-employed workers often benefit from greater job control, allowing them to regulate their workload and schedules, which may buffer psychological strain^{31,32}. Employees, on the other hand, are typically subject to fixed hours and hierarchical oversight, reducing their autonomy and increasing stress exposure. Previous studies have shown that job-related stress is one of the risk factors closely associated with mental health disorders like depression^{33,34} and anxiety³⁵. Our findings reflect this contrast: employees reported greater mental health burdens, while self-employed individuals exhibited greater presenteeism and absenteeism.

These findings have important implications for occupational health policy. In South Korea—where 23.5% of the labor force is self-employed—current labor protections fall short³⁶. Self-employed workers remain largely outside the scope of key labor laws, including the Labor Standards Act and Industrial Accident Compensation Insurance³⁷. There is a critical need to expand the legal definition of "worker" to include the self-employed and to improve access to public health and social safety nets. For employees, introducing statutory paid sick leave is essential to reducing presenteeism and supporting recovery. South Korea is one of the few OECD countries without such provisions³⁸.

This study's strengths include its use of data from the 6th Korean Working Conditions Survey (KWCS), which includes a large sample of over 50,000 individuals, thereby ensuring high reliability. The sample was selected to provide balanced representation across regions, age groups, and occupations, minimizing selection bias. Furthermore, sampling weights were applied to reflect the population

structure, enhancing the generalizability of the findings to the entire Korean workforce. In addition, this study enabled a focused assessment of weekend work by excluding night, shift, and long-hour work, and it is also the first Korean study to explore the health risks of weekend work by employment type. However, several limitations should be noted. First, since the analysis of certain health variables such as musculoskeletal pain, headaches or eye pain relied on self-reported responses without standardized diagnostic instruments, which may have introduced recall bias or misclassification. Second, the KWCS lacks information on broader systemic health conditions (e.g., cardiovascular, respiratory, and digestive disorders), limiting the generalizability of our findings to overall physical health. Third, key behavioral and medical confounders-such as alcohol consumption, smoking, and chronic disease history-were not available in the dataset, which may have influenced the observed associations. Fourth, the study did not account for job category or industry, which could influence the likelihood of weekend work and health outcomes, thus introducing residual confounding. Fifth, although this study benefits from the use of a large-scale, nationally representative dataset, there are limitations in the generalizability of its findings. The data were collected during the COVID-19 pandemic, a period marked by atypical working conditions that may have influenced the results. In addition, the exclusion of workers in other non-standard employment arrangements limits the applicability of the findings to the entire workforce. Therefore, caution should be exercised when generalizing these results to the broader working population. Lastly, the cross-sectional design precludes causal inference, as it is not possible to establish temporal directionality between weekend work and adverse health effects.

CONCLUSIONS

Weekend work is significantly associated with a range of adverse health outcomes, with varying effects by employment status. These findings support the need for differentiated and inclusive occupational health policies, alongside future longitudinal research to better understand the mechanisms linking weekend work to worker health.

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394 **Figure Legends**

395 **Fig. 1.** Sample selection process with inclusion and exclusion criteria.

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Table

Table 1. Participants' characteristics according to weekend work status

Characteristics	Total	Weekend Work		<i>p</i> -value
		No	Yes	
Total	36,920	25,665 (69.52)	11,255 (30.48)	
Gender				<0.001***
Male	20,597 (55.79)	13,835 (53.91)	6,763 (60.09)	
Female	16,322 (44.21)	11,830 (46.09)	4,492 (39.91)	
Age, y				<0.001***
15-29	5,110 (13.84)	3,400 (13.25)	1,711 (15.20)	
30-39	7,439 (20.15)	5,651 (22.02)	1,788 (15.88)	
40-49	8,914 (24.14)	6,499 (25.32)	2,415 (21.46)	
50-59	8,379 (22.70)	5,578 (21.73)	2,800 (24.88)	
60-	7,078 (19.17)	4,536 (17.68)	2,541 (22.58)	
Education				<0.001***
High-school graduate or lower	15,909 (43.09)	9,670 (37.73)	6,240 (55.49)	
College graduate	20,964 (56.78)	15,959 (62.27)	5,005 (44.51)	
Monthly income (10,000 KRW)				<0.001***
< 200	10,806 (29.27)	7,258 (29.77)	3,547 (32.87)	
200-299	10,491 (28.42)	7,092 (29.08)	3,399 (31.49)	
300-399	7,375 (19.98)	5,193 (21.29)	2,182 (20.22)	
≥ 400	6,506 (17.62)	4,841 (19.85)	1,664 (15.42)	
Status of employment				<0.001***
Self-employed	6,188 (16.76)	2,669 (10.40)	3,520 (31.27)	
Employee	30,731 (83.24)	22,996 (89.60)	7,735 (68.72)	
Work hours per week				0.003**
<40	9,277 (25.13)	6,274 (24.45)	3,003 (26.68)	
40-52	27,642 (74.87)	19,391 (75.55)	8,252 (73.32)	

Values are presented as weighted frequency (%).

Table 2. Prevalence of the health outcomes according to weekend work status

unit: n (%)

Health outcomes	Weekend Work		<i>p</i> -value
	No	Yes	
General health			
Poor	929 (3.62)	527 (4.68)	<0.001***
Psychological health			
Sleep disorder	1,901 (7.41)	967 (8.59)	0.006**
Depression	7,590 (29.57)	3,734 (33.18)	<0.001***
Anxiety	1,105 (4.31)	656 (5.83)	<0.001***
Physical health			
Musculoskeletal pain	9,133 (35.59)	5,272 (46.84)	<0.001***
Headache or eye pain	4,965 (19.35)	1,979 (17.58)	0.009**
Fatigue	5,251 (20.46)	3,196 (28.40)	<0.001***
Sickness absence			
Have experienced	759 (2.96)	551 (4.90)	<0.001***
Presenteeism			
Have experienced	2,170 (8.46)	1,585 (14.08)	<0.001***

Values are presented as weighted frequency (%).

Table 3. Odds ratios (95% CIs) for health outcomes of weekend workers to non-weekend workers

Health outcomes	Crude model			Adjusted model ^a		
	OR	(95% CI)	<i>p</i> -value	OR	(95% CI)	<i>p</i> -value
General health						
Poor	1.31	(1.13-1.52)	<0.001***	1.11	(0.95-1.29)	0.210
Psychological health						
Sleep disorder	1.18	(1.05-1.32)	0.006**	1.11	(0.98-1.27)	0.093
Depression	1.18	(1.10-1.27)	<0.001***	1.08	(1.00-1.18)	0.049*
Anxiety	1.38	(1.18-1.60)	<0.001***	1.35	(1.16-1.58)	<0.001***
Physical health						
Musculoskeletal pain	1.60	(1.49-1.71)	<0.001***	1.45	(1.34-1.58)	<0.001***
Headache or eye pain	0.89	(0.82-0.97)	0.009**	0.98	(0.89-1.07)	0.607
Fatigue	1.54	(1.43-1.67)	<0.001***	1.49	(1.36-1.62)	<0.001***
Sickness absence						
Have experienced	1.69	(1.41-2.01)	<0.001***	1.70	(1.43-2.03)	<0.001***
Presenteeism						
Have experienced	1.77	(1.59-1.98)	<0.001***	1.82	(1.62-2.04)	<0.001***

^aAdjusted for gender, age, education, monthly income, status of employment, work hours per week.

Table 4. Odds ratios (95% CIs) for health outcomes of weekend workers to non-weekend workers, stratified by status of employment

Health outcomes	Crude model			Adjusted model ^a		
	OR	(95% CI)	<i>p</i> -value	OR	(95% CI)	<i>p</i> -value
Self-employed						
General health						
Poor	1.50	(1.19-1.90)	<0.001***	1.31	(1.00-1.72)	0.053
Psychological health						
Sleep disorder	1.12	(0.90-1.38)	0.307	1.03	(0.82-1.30)	0.796
Depression	1.07	(0.92-1.25)	0.362	0.98	(0.83-1.15)	0.758
Anxiety	1.19	(0.90-1.58)	0.214	1.17	(0.89-1.55)	0.264
Physical health						
Musculoskeletal pain	1.70	(1.46-1.97)	<0.001***	1.47	(1.24-1.73)	<0.001***
Headache or eye pain	0.84	(0.70-1.03)	0.087	0.86	(0.71-1.06)	0.151
Fatigue	1.49	(1.25-1.78)	<0.001***	1.37	(1.15-1.63)	<0.001***
Sickness absence						
Have experienced	2.35	(1.63-3.38)	<0.001***	2.34	(1.58-3.46)	<0.001***
Presenteeism						
Have experienced	2.26	(1.77-2.89)	<0.001***	2.20	(1.71-2.84)	<0.001***
Employee						
General health						
Poor	0.89	(0.73-1.08)	0.238	0.97	(0.79-1.20)	0.779
Psychological health						
Sleep disorder	1.07	(0.93-1.24)	0.350	1.13	(0.97-1.31)	0.116
Depression	1.15	(1.05-1.26)	0.002**	1.11	(1.01-1.22)	0.025*
Anxiety	1.37	(1.14-1.64)	<0.001***	1.40	(1.17-1.68)	<0.001***
Physical health						
Musculoskeletal pain	1.40	(1.29-1.53)	<0.001***	1.45	(1.32-1.59)	<0.001***
Headache or eye pain	0.90	(0.81-1.00)	0.051	1.00	(0.90-1.11)	0.983
Fatigue	1.47	(1.34-1.62)	<0.001***	1.52	(1.38-1.67)	<0.001***
Sickness absence						
Have experienced	1.57	(1.28-1.91)	<0.001***	1.59	(1.30-1.94)	<0.001***
Presenteeism						
Have experienced	1.65	(1.46-1.87)	<0.001***	1.75	(1.54-1.99)	<0.001***

^aAdjusted for gender, age, education, monthly income, status of employment, work hours per week.

Table

Table 1. Participants' characteristics according to weekend work status

				unit: n (%)
Characteristics	Total	Weekend Work		p-value
		No	Yes	
Total	36,920	25,665 (69.52)	11,255 (30.48)	
Gender				<0.001***
Male	20,597 (55.79)	13,835 (53.91)	6,763 (60.09)	
Female	16,322 (44.21)	11,830 (46.09)	4,492 (39.91)	
Age, y				<0.001***
15-29	5,110 (13.84)	3,400 (13.25)	1,711 (15.20)	
30-39	7,439 (20.15)	5,651 (22.02)	1,788 (15.88)	
40-49	8,914 (24.14)	6,499 (25.32)	2,415 (21.46)	
50-59	8,379 (22.70)	5,578 (21.73)	2,800 (24.88)	
60-	7,078 (19.17)	4,536 (17.68)	2,541 (22.58)	
Education				<0.001***
High-school graduate or lower	15,909 (43.09)	9,670 (37.73)	6,240 (55.49)	
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Sleep disorder	1,901 (7.41)	967 (8.59)	0.006**
Depression	7,590 (29.57)	3,734 (33.18)	<0.001***
Anxiety	1,105 (4.31)	656 (5.83)	<0.001***
Physical health			
Musculoskeletal pain	9,133 (35.59)	5,272 (46.84)	<0.001***
Headache or eye pain	4,965 (19.35)	1,979 (17.58)	0.009**
Fatigue	5,251 (20.46)	3,196 (28.40)	<0.001***
Sickness absence			
Have experienced	759 (2.96)	551 (4.90)	<0.001***
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Fatigue	1.54	(1.43-1.67)	<0.001***	1.49	(1.36-1.62)	<0.001***
Sickness absence						
Have experienced	1.69	(1.41-2.01)	<0.001***	1.70	(1.43-2.03)	<0.001***
Presenteeism						
Have experienced	1.77	(1.59-1.98)	<0.001***	1.82	(1.62-2.04)	<0.001***

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