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Risk factors for workplace bullying, severe psychological distress and suicidal ideation during the COVID-19 pandemic among the general working population in Japan: a large-scale cross-sectional study

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ABSTRACT

Objectives To investigate the risk factors for workplace bullying and mental health outcomes among workers during the COVID-19 pandemic.

Design A cross-sectional study.

Setting A nationwide online survey was conducted from August to September 2020 in Japan.

Participants 16 384 workers (men: n=9565; women: n=6789).

Main outcome variables Workplace bullying was measured by one item from the Brief Job Stress Questionnaire; severe psychological distress according to the Kessler Psychological Distress Scale (≥13) and suicidal ideation by one item. Prevalence ratios were calculated by modified Poisson regression analyses adjusting for potential confounders such as gender, age, occupational characteristics and a prior history of depression.

Results Overall, 15% of workers experienced workplace bullying, 9% had severe psychological distress and 12% had suicidal ideation during the second and third wave of the COVID-19 pandemic in Japan. The results of this study showed men, executives, managers and permanent employees had a higher risk of bullying than women or part-time workers. Increased physical and psychological demands were common risk factors for bullying, severe psychological distress and suicidal ideation. Starting to work from home was a significant predictor for adverse mental health outcomes but a preventive factor against workplace bullying.

Conclusions The results of this study showed different high-risk groups for bullying or mental health during the pandemic. Any intervention to decrease workplace bullying or mental health problems should focus not only on previously reported vulnerable workers but also workers who have experienced a change in work style or job demands.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ No previous study has investigated the important risk factors for workplace bullying, severe psychological distress and suicidal ideation during the COVID-19 pandemic among the general working population.
⇒ Various risk factors, including socioeconomic status, industry, working from home and change in job demands, were investigated and analysed, stratified by gender.
⇒ One limitation of our study is that causality cannot be determined due to the cross-sectional design.
⇒ The survey was conducted using the internet, which may limit generalisability of our study results.

INTRODUCTION

Workplace bullying is defined as a situation where worker(s) suffer from repeated hostile or aggressive acts, including physically abusing, harassing, offending, socially excluding someone or negatively affecting someone's work tasks, for example, by withholding relevant information.[1] Workplace bullying is a severe job stressor in the workplace. Although the prevalence of workplace bullying during the COVID-19 pandemic is unknown, the global prevalence before the pandemic was reported as 14.6% in a meta-analysis by Nielsen *et al*.[2]

Previous studies clearly show workplace bullying has a severe adverse effect on workers' mental health. For example, longitudinal associations between workplace bullying and depression,[3] post-traumatic stress disorder[4] and suicidal ideation[5] have been reported in systematic reviews or meta-analyses. Moreover, mental health problems are not only 'outcomes' but also 'antecedents' of workplace bullying. Meta-analyses on the association between workplace bullying and mental health have consistently reported that baseline mental health problems are associated with an increased risk of exposure to

workplace bullying.[3 6] Thus, when investigating the association between bullying and mental health, the reverse effect should be taken into consideration.

Previous studies have suggested that women and younger workers are more likely to experience bullying,[7 8] although the results on the association between age and bullying were found to be inconsistent in a recent systematic review.[7] Low socioeconomic status (SES), measured by education, income and occupation, was also reported as a risk factor for workplace bullying.[9] This is probably due to the lower organisational positions occupied by lower SES workers; workers in more senior positions such as managers were less likely than unskilled workers to be exposed to bullying.[10] Nevertheless, only one previous study on workplace bullying has focused on income,[9] and a few on education,[9 11 12] but most other studies only investigated occupation as a risk factor for workplace bullying.[7] Low SES workers tend to have unstable working conditions and their economic situation may have worsened during the COVID-19 pandemic, increasing their vulnerability.[13] More research on workplace bullying needs to focus on the most disadvantaged workers in society.

Although high job demands are associated with exposure to workplace bullying,[7 14–16] no study has investigated an association between increased job demands or new work style—working from home—and exposure to workplace bullying. Under the COVID-19 pandemic, many workers, especially essential workers, experienced workloads that were physically and psychologically excessive and have developed psychological distress or burnout.[17 18] In contrast, the number of non-essential workers working from home increased during the pandemic.[19] These changes in work style or the workplace can also result in workplace bullying as change causes stress among workers and stressful working environments increase bullying behaviours.[8 20 21]

An association between working from home and adverse mental health has not been fully investigated. During the pandemic, suicide rates increased from 2019 to 2020 in Japan, for the first time in a decade.[22] Determinants of the increase have not been fully investigated yet, but a recent study reported an increase in social isolation was associated with suicidal ideation in the general population during the pandemic.[23] In general, workers are less likely to be isolated compared with unemployed people because they usually have daily opportunities for social interaction in the workplace. However, the situation may be different for people working from home who will not have this social interaction, although working from home itself has a positive impact on workers' work–life balance.[24] A recent large-scale study in an information company with over 60 000 employees during the pandemic showed that working from home has negative effects, such as decreasing synchronous communication between workers and decreasing bridges between disparate departments in a company.[25]

Various risk factors for mental health problems among workers have been reported during the COVID-19 pandemic. For example, healthcare workers,[18 26] less-educated workers[27] and non-regular female workers[28] were more likely to have greater psychological distress. However, studies focusing on the general working population from various industries are scarce, since the majority have focused only on healthcare workers.[26]

Therefore, the aim of this study was to identify the potential risk factors for workplace bullying, severe psychological distress and suicidal ideation during the pandemic, such as gender, age, SES, job demands and working from home, using a nationwide internet survey for the general working population in Japan.

METHODS

Data

We used the baseline cross-sectional data of an ongoing web-based nationally representative longitudinal study, the Japan 'COVID-19 and Society' Internet Survey (JACSIS) study. The baseline survey was conducted in August and September 2020. Survey requests were sent by the research agency (Rakuten Insight, Tokyo, Japan) to 224 389 panellists who were selected by each gender, age and prefecture category using simple random sampling. Once the target number of participants (N=28 000) answered the questionnaire, the recruitment process stopped, resulting in a participation rate for the survey of 12.5% (28 000 of 224 389). The details of the study protocol are described elsewhere.[29]

To validate data quality, we excluded respondents showing discrepancies and artificial/unnatural responses.[30] The checks used to detect discrepancies were: failing to correctly respond to the request: 'Please choose the second from the bottom,' answering 'yes' to every item in a set of questions for using drugs, and answering 'yes' to every items in a set of questions for having chronic diseases. Excluding these respondents (n=2518) resulted in a total of 25 482 participants.

Patient and public involvement statement

No patients and the public were involved in the design, the recruitment and conduct of this study. They will be involved when the study results of the study are disseminated via website or social networking services.

Measurements

Risk factors

Our exposure variables of interest were respondents' demographic variables including gender,[7] age,[8] residential area and marital status (having a partner/spouse), SES,[9] occupational characteristics and current work situation. The SES variables included education (high school or below, junior college/vocational school and university or above)[9]; annual household income during the previous year (1.99 million, 2.00–3.99 million, 4.00–5.99 million, 6.00–7.99 million, 8.00–9.99 million, 10 million and unknown); and occupation/employment status (executive, self-employed/individual business owner, family

Table 1 Participant characteristics (N=16 384)

Individual characteristics	n	%
Gender		
Men	9595	58.6
Women	6789	41.4
Age		
Under 24	1024	6.3
25–34	2964	18.1
35–44	3673	22.4
45–54	4146	25.3
55–64	2914	17.8
Over 65	1663	10.2
Have a partner/spouse		
Yes	9633	58.8
No	6751	41.2
Residential area		
Prefecture under special precautions	10 246	62.5
Other	6138	37.5
Socioeconomic status (SES)		
Education		
High school or below	4167	25.4
Junior college/vocational school	3658	22.3
University or above	8559	52.2
Annual household income during the previous year (million yen)		
1.99 or less	987	6.0
2.00–3.99	3053	18.6
4.00–5.99	3469	21.2
6.00–7.99	2481	15.1
8.00–9.99	1744	10.6
10.00 or more	1998	12.2
Unknown	2652	16.2
Occupation/employment status		
Executive	927	5.7
Self-employed/individual business owner	1548	9.4
Family business assistance	210	1.3
Manager	2014	12.3
Permanent worker (non-manager)	7201	44.0
Agency worker	366	2.2
Contract worker	1062	6.5
Part-time worker	3056	18.7
Occupational characteristics		
Industry		
Public administration	1065	6.5
Agriculture, forestry and fishing	181	1.1
Construction	908	5.5
Manufacturing	2748	16.8
Electricity, gas and water supply	235	1.4
Telecommunication	844	5.2
Transport	684	4.2
Wholesale	571	3.5
Retail trade	1269	7.7
Finance	423	2.6
Insurance	288	1.8
Real estate	396	2.4
Restaurants	508	3.1
Hotels	151	0.9
Healthcare	1201	7.3
Welfare	704	4.3
Education and learning assistance	853	5.2
Other	3355	20.5
Office size (employees)		
1–4	2379	14.5
5–29	3241	19.8
30–49	1161	7.1
50–99	1625	9.9
100–299	2145	13.1
300–499	999	6.1
500–999	1065	6.5
Over 1000	3158	19.3
Civil service	611	3.7
Job types		
Desk based	7944	48.5
Working with people	4024	24.6
Physical work	4416	27.0
Current working situation	n	%
Started to work from home during the pandemic		
Yes	1382	8.4
No	15 002	91.6
Worked from home since before the pandemic		
Yes	2964	18.1
No	13 420	81.9
Increased physical demands		
Yes	3389	20.7
No	12 995	79.3
Increased psychological demands		
Yes	5421	33.1
No	10 963	66.9
Weekly working hours during the previous month		
Less than 20 hours/week	2688	16.4
20–29 hours/week	1821	11.1
30–39 hours/week	3103	18.9
40–44 hours/week	4676	28.5
45–49 hours/week	1900	11.6
50–59 hours/week	1265	7.7
Over 60 hours/week	931	5.7
History of psychiatric disorders		
Mental illness		
Depression		

Continued

Table 1 Continued

Individual characteristics	n	%
Never	14782	90.2
Past	989	6.0
Current	613	3.7
Other mental illness		
Never	15203	92.8
Past	611	3.7
Current	570	3.5
Exposure to workplace bullying		
Yes	2441	14.9
No	13943	85.1
Witnessed workplace bullying		
Yes	2940	17.9
No	13444	82.1
Severe psychological distress (K6 ≥13)		
Yes	1442	8.8
No	14942	91.2
Suicidal ideation		
Yes	1890	11.5
No	14494	88.5

K6, Kessler Psychological Distress Scale.

business assistance, manager, permanent worker, agency worker, contract worker and part-time worker).

Occupational characteristics included industry, office size and job type (desk based, working with people (eg, sales staff, hospitality workers) and physical work (eg, delivery staff, care staff)). To assess their current work situation, we asked respondents if they had experience of working from home or increased physical or psychological demands during the COVID-19 pandemic. Weekly working hours during the previous month were also assessed as categorical variables.

Finally, prior history of depression and other mental illnesses was assessed, since baseline mental health problems were associated with an increased risk of exposure to workplace bullying.[3 6]

Workplace bullying

Workplace bullying was assessed by a self-labelling method, using a sub-scale of the New Brief Job Stress Questionnaire.[9] First, respondents were asked whether they experienced bullying during the previous 6 months, using the single item 'Have you been bullied in your workplace during the 6 months since April 2020?' Respondents who chose 'yes' were defined as 'victims'. In the survey, we did not provide a definition of bullying for respondents due to limitations of space. In addition to the above-mentioned question, respondents were asked whether they had witnessed bullying in their workplace during the previous 6 months.

Mental health outcomes

Severe psychological distress was measured by the 6-item Kessler Psychological Distress Scale (K6).[31] The K6 consists of six items and assesses how frequently respondents have experienced symptoms of psychological distress during the past 30 days ('0=never,' '1=rarely,' '2=sometimes,' '3=often' or '4=always'). In this study, a cut-off score of 13 was used for defining severe psychological distress.[32]

Suicidal ideation was assessed by one question 'Since April 2020, have you ever wished you were dead?' The response options were' '1=yes, for the first time', '2=yes, but I experienced this before April 2020' or '3=never experienced it'. Answering 'yes' was defined as having suicidal ideation.

Statistical analyses

We used a modified Poisson regression analysis with robust error variance to examine the relationship between risk factors and workplace bullying because most of the outcome prevalence is common (>10%) in this study.[33–35] Prevalence ratios (PRs) and 95% confidence intervals (CIs) were calculated adjusting for individual characteristics (gender, age, having a partner and residential area); SES (education, household income and employment status) (model 1); occupational characteristics (industry, office size and job type) (model 2); all variables including current work situation (started to work from home during the pandemic, increased physical demands, increased psychological demands and increased weekly working hours during the previous month) and a prior history of depression (model 3). To examine the relationship between workplace bullying and mental health outcomes, we also conducted another modified Poisson regression analysis. In these analyses, PRs and 95% CIs were calculated adjusting for individual characteristics, SES, occupational characteristics (model 1) and a prior history of depression (model 2). Finally, we conducted a modified Poisson regression analysis stratified by gender. In this analysis, the prevalence ratios of two mental health outcomes were calculated by adjusting individual characteristics, SES, occupational characteristics, workplace bullying and a prior history of depression. The two-tailed p value for statistical significance to see the differences between one indicator and another was set at 0.05. All analyses were conducted using SPSS V.27.0 for Windows. There were no missing values in these data because all questions required an answer.

RESULTS

Characteristics of participants

Table 1 shows the participant characteristics. Of 25482 respondents, we analysed 16384 workers in this study after excluding students, retired persons, full-time housewives/househusbands and those who were not working at the time of the survey. The average participant age was 45.7 (SD: 13.8) years old. The majority were men, 45–54 years old, had a partner/spouse and

Table 2 Prevalence ratios of workplace bullying: modified Poisson regression analysis (N=16 384)

	Workplace bullying Case (%)	PRs (95% CI) Model 1	PRs (95% CI) Model 2	PRs (95% CI) Model 3
Gender				
Men	1588 (16.6)	**1.30 (1.20 to 1.42)**	**1.32 (1.21 to 1.44)**	**1.32 (1.21 to 1.45)**
Women	853 (12.6)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Age				
Under 24	227 (22.2)	**2.98 (2.36 to 3.76)**	**2.73 (2.16 to 3.51)**	**2.71 (2.14 to 3.42)**
25–34	570 (19.2)	**2.74 (2.22 to 3.39)**	**2.58 (2.08 to 3.20)**	**2.55 (2.06 to 3.15)**
35–44	599 (16.3)	**2.41 (1.96 to 2.97)**	**2.33 (1.90 to 2.88)**	**2.29 (1.86 to 2.82)**
45–54	610 (14.7)	**2.18 (1.77 to 2.68)**	**2.14 (1.74 to 2.64)**	**2.10 (1.70 to 2.58)**
55–64	331 (11.4)	**1.70 (1.37 to 2.10)**	**1.67 (1.34 to 2.07)**	**1.64 (1.32 to 2.03)**
Over 65	104 (6.3)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Have a partner/spouse				
Yes	1318 (13.7)	1.00 (reference)	1.00 (reference)	1.00 (reference)
No	1123 (16.6)	1.01 (0.92 to 1.09)	0.99 (0.92 to 1.08)	0.999 (0.92 to 1.09)
Residential area				
Prefecture under special precautions	1534 (15.0)	1.01 (0.93 to 1.08)	1.00 (0.93 to 1.08)	1.00 (0.93 to 1.08)
Other	907 (14.8)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Education				
High school or below	617 (14.8)	1.06 (0.97 to 1.16)	1.08 (0.99 to 1.19)	1.09 (0.99 to 1.20)
Junior college/vocational school	501 (13.7)	1.00 (0.90 to 1.10)	0.99 (0.90 to 1.10)	1.00 (0.91 to 1.11)
University or above	1323 (15.5)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Annual household income during the previous year (million yen)				
Unknown	194 (19.7)	**1.17 (1.01 to 1.36)**	**1.22 (1.05 to 1.42)**	**1.22 (1.05 to 1.42)**
1.99 or less	503 (16.5)	**1.74 (1.46 to 2.09)**	**1.84 (1.53 to 2.21)**	**1.82 (1.52 to 2.19)**
2.00–3.99	527 (15.2)	**1.34 (1.16 to 1.55)**	**1.39 (1.20 to 1.61)**	**1.39 (1.20 to 1.62)**
4.00–5.99	346 (13.9)	1.13 (0.99 to 1.30)	**1.17 (1.01 to 1.34)**	**1.16 (1.01 to 1.34)**
6.00–7.99	234 (13.4)	1.01 (0.88 to 1.18)	1.03 (0.89 to 1.20)	1.03 (0.89 to 1.20)
8.00–9.99	275 (13.8)	0.97 (0.82 to 1.13)	0.98 (0.83 to 1.15)	0.98 (0.83 to 1.14)
10.00 or more	362 (13.7)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Occupation/employment status				
Executive	178 (19.2)	**1.69 (1.43 to 2.00)**	**1.77 (1.49 to 2.12)**	**1.76 (1.48 to 2.09)**
Self-employed/ individual business owner	129 (8.3)	0.77 (0.63 to 0.94)	1.05 (0.82 to 1.35)	1.05 (0.82 to 1.35)
Family business assistance	21 (10.0)	0.93 (0.61 to 1.40)	1.18 (0.76 to 1.83)	1.15 (0.75 to 1.78)
Manager	341 (16.9)	**1.47 (1.26 to 1.71)**	**1.39 (1.19 to 1.64)**	**1.40 (1.20 to 1.65)**
Permanent employee (non-manager)	1250 (17.4)	**1.32 (1.17 to 1.50)**	**1.27 (1.11 to 1.45)**	**1.27 (1.12 to 1.45)**
Agency worker	44 (12.0)	0.93 (0.70 to 1.26)	0.88 (0.65 to 1.19)	0.87 (0.65 to 1.18)
Contract worker	142 (13.4)	1.20 (0.99 to 1.44)	1.14 (0.94 to 1.38)	1.13 (0.93 to 1.37)
Part-time worker	336 (11.0)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Industry				
Public administration	170 (16.0)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Agriculture, forestry and fishing	31 (17.1)	1.34 (0.95 to 1.89)	1.31 (0.91 to 1.87)	1.31 (0.92 to 1.87)
Construction	133 (14.6)	0.99 (0.81 to 1.22)	0.97 (0.76 to 1.22)	0.98 (0.77 to 1.23)
Manufacturing	456 (16.6)	1.04 (0.89 to 1.22)	0.92 (0.76 to 1.12)	0.92 (0.76 to 1.12)
Electricity, gas and water supply	44 (18.7)	1.18 (0.87 to 1.59)	1.08 (0.78 to 1.48)	1.07 (0.78 to 1.47)
Telecommunication	126 (14.9)	0.92 (0.75 to 1.14)	0.83 (0.66 to 1.06)	0.84 (0.66 to 1.07)

Continued

Table 2 Continued

	Workplace bullying Case (%)	PRs (95% CI) Model 1	PRs (95% CI) Model 2	PRs (95% CI) Model 3
Transport	107 (15.6)	0.98 (0.79 to 1.22)	0.87 (0.67 to 1.11)	0.87 (0.68 to 1.12)
Wholesale	93 (16.3)	1.08 (0.86 to 1.36)	1.01 (0.78 to 1.29)	1.01 (0.78 to 1.30)
Retail trade	158 (12.5)	0.97 (0.79 to 1.20)	0.87 (0.69 to 1.11)	0.88 (0.70 to 1.12)
Finance	67 (15.8)	1.06 (0.82 to 1.38)	0.93 (0.70 to 1.23)	0.94 (0.71 to 1.25)
Insurance	37 (12.8)	0.96 (0.69 to 1.33)	0.86 (0.61 to 1.22)	0.87 (0.61 to 1.23)
Real estate	56 (14.1)	1.15 (0.87 to 1.53)	1.13 (0.84 to 1.52)	1.15 (0.85 to 1.55)
Restaurants	81 (15.9)	1.21 (0.94 to 1.55)	1.12 (0.85 to 1.48)	1.13 (0.85 to 1.48)
Hotels	24 (15.9)	1.09 (0.74 to 1.61)	0.97 (0.65 to 1.47)	0.97 (0.64 to 1.45)
Healthcare	205 (17.1)	**1.23 (1.02 to 1.48)**	1.10 (0.88 to 1.37)	1.11 (0.89 to 1.38)
Welfare	119 (16.9)	1.22 (0.98 to 1.52)	1.13 (0.89 to 1.44)	1.12 (0.88 to 1.43)
Education and learning assistance	104 (12.2)	0.98 (0.78 to 1.23)	0.91 (0.71 to 1.17)	0.91 (0.71 to 1.17)
Other	430 (12.8)	0.98 (0.83 to 1.16)	0.92 (0.76 to 1.12)	0.92 (0.76 to 1.13)
Office size				
1–4	208 (8.7)	1.00 (reference)	1.00 (reference)	1.00 (reference)
5–29	427 (13.2)	**1.32 (1.08 to 1.62)**	**1.32 (1.08 to 1.61)**	**1.31 (1.07 to 1.60)**
30–49	165 (14.2)	**1.39 (1.11 to 1.76)**	**1.39 (1.10 to 1.76)**	**1.38 (1.10 to 1.75)**
50–99	252 (15.5)	**1.51 (1.22 to 1.88)**	**1.52 (1.22 to 1.90)**	**1.52 (1.22 to 1.89)**
100–299	398 (18.6)	**1.76 (1.43 to 2.16)**	**1.78 (1.44 to 2.19)**	**1.78 (1.44 to 2.19)**
300–499	171 (17.1)	**1.61 (1.28 to 2.02)**	**1.63 (1.30 to 2.05)**	**1.62 (1.29 to 2.05)**
500–999	197 (18.5)	**1.79 (1.43 to 2.24)**	**1.82 (1.45 to 2.29)**	**1.81 (1.44 to 2.28)**
Over 1000	541 (17.1)	**1.62 (1.32 to 2.00)**	**1.68 (1.37 to 2.06)**	**1.68 (1.37 to 2.06)**
Government office	82 (13.4)	1.30 (0.99 to 1.71)	1.28 (0.93 to 1.75)	1.28 (0.94 to 1.76)
Job type				
Desk based	1161 (14.6)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Working with people	619 (15.4)	1.09 (0.996 to 1.19)	1.10 (0.98 to 1.22)	1.09 (0.98 to 1.21)
Physical work	661 (15.0)	1.04 (0.996 to 1.19)	1.01 (0.91 to 1.11)	1.00 (0.90 to 1.10)
Started to work from home during the pandemic				
Yes	406 (13.7)	**0.83 (0.74 to 0.91)**	**0.82 (0.74 to 0.92)**	**0.81 (0.73 to 0.91)**
No	2035 (15.2)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Worked from home since before the pandemic				
Yes	188 (13.6)	1.06 (0.92 to 1.22)	1.11 (0.96 to 1.27)	1.08 (0.94 to 1.25)
No	2253 (15.0)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Increased physical demands				
Yes	696 (20.5)	**1.45 (1.34 to 1.57)**	**1.42 (1.31 to 1.54)**	**1.40 (1.29 to 1.51)**
No	1745 (13.4)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Increased psychological demands				
Yes	953 (17.6)	**1.25 (1.16 to 1.35)**	**1.23 (1.14 to 1.33)**	**1.21 (1.12 to 1.31)**
No	1488 (13.6)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Weekly working hours during the previous month				
Less than 20 hours/week	355 (13.2)	1.00 (reference)	1.00 (reference)	1.00 (reference)
20–29 hours/week	279 (15.3)	1.08 (0.94 to 1.24)	1.05 (0.91 to 1.21)	1.04 (0.91 to 1.20)
30–39 hours/week	441 (14.2)	**0.83 (0.73 to 0.95)**	**0.82 (0.71 to 0.94)**	**0.82 (0.72 to 0.94)**
40–44 hours/week	679 (14.5)	**0.73 (0.64 to 0.83)**	**0.71 (0.63 to 0.82)**	**0.72 (0.63 to 0.82)**
45–49 hours/week	285 (15.0)	**0.74 (0.63 to 0.87)**	**0.73 (0.62 to 0.85)**	**0.74 (0.63 to 0.86)**
50–59 hours/week	222 (17.5)	0.86 (0.73 to 1.02)	0.85 (0.72 to 1.01)	0.86 (0.73 to 1.01)
Over 60 hours/week	180 (19.3)	0.98 (0.83 to 1.17)	0.99 (0.83 to 1.18)	0.99 (0.83 to 1.17)

Continued

Table 2 Continued

	Workplace bullying Case (%)	PRs (95% CI) Model 1	PRs (95% CI) Model 2	PRs (95% CI) Model 3
Mental illness				
Depression				
Never	2032 (13.7)	1.00 (reference)	1.00 (reference)	–
Past	223 (22.5)	**1.58 (1.40 to 1.79)**	**1.58 (1.40 to 1.78)**	–
Current	186 (30.3)	**2.00 (1.76 to 2.27)**	**1.98 (1.75 to 2.25)**	–
Other mental illness				
Never	2102 (13.8)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Past	158 (25.9)	**1.75 (1.53 to 2.01)**	**1.74 (1.51 to 1.99)**	**1.59 (1.37 to 1.83)**
Current	181 (31.8)	**2.09 (1.84 to 2.38)**	**2.08 (1.83 to 2.36)**	**2.01 (1.77 to 2.29)**

Model 1: Individual characteristics (gender, age, residential area and having a partner) and SES (education, household income and employment status) adjusted in the model.
Model 2: In addition to model 1, occupational characteristics (industry, office size and job type) were adjusted in the model.
Model 3: In addition to model 2, a prior history of depression was entered in the model.
Bold values show statistically significant results.
PRs, prevalence ratios; SES, socioeconomic status.

lived in a prefecture under special precautions during the first COVID-19 state of emergency in Japan (April–May 2020). Regarding SES variables, most of the participants had graduated from university or school, earned ¥4.00–¥5.99 million during the previous year and were permanent workers. Regarding occupational characteristics, the majority worked in the manufacturing industry and in a small office with 5–29 employees or a large office with more than 1000 employees. Their work was mainly desk based. Only 8% had started to work from home during the pandemic but approximately 20% were already working from home when the pandemic began, meaning in total about 30% of participants were working from home during the pandemic period. Although most of the participants had worked 40–44 hours/week during the past month, 6% worked over 60 hours/week. Overall, 21% experienced increased physical demands and 33% experienced increased psychological demands during the pandemic. About 4% had depression or other mental illness at the time of the survey and 6% or 4% had a prior history of depression or other mental illness, respectively.

Overall, 15% of the participants had experienced workplace bullying during the past 6 months and 18% witnessed bullying at their workplaces during the past 6 months. About 9% had experienced severe psychological distress during the past 30 days and 12% had suicidal ideation during the past 6 months.

Risk factors for exposure to workplace bullying

Table 2 shows the results of the modified Poisson regression analysis, which calculated the PRs for workplace bullying. The significant risk factors for workplace bullying were gender (men), younger age, lower household income (¥1.99–¥5.99 million), occupation (executive, manager and permanent employee), larger office size, increased physical or psychological demands and current or prior history of depression or other mental illness. Those who started to work from home during the pandemic or worked 30–49 hours/week had a lower risk of exposure to workplace bullying.

Association between workplace bullying and mental health outcomes

Exposure to workplace bullying was significantly associated with severe psychological distress and suicidal ideation (PR for severe psychological distress: 2.84 (95% CI 2.55 to 3.15); PR for suicidal ideation: 2.13 (95% CI 1.94 to 2.34)), after adjusting for individual characteristics, SES, occupational characteristics and a prior history of depression (model 2 in table 3). Although larger PRs were observed for exposure to workplace bullying, witnessing bullying was also significantly associated with severe psychological distress and suicidal ideation in model 2 (PR for severe psychological distress: 1.90 (95% CI 1.60 to 2.25); PR for suicidal ideation: 1.41 (95% CI 1.20 to 1.64)). When stratified by gender, men who experienced workplace bullying had higher PRs for both severe psychological distress and suicidal ideation than women (PR for severe psychological distress: 3.60 (95% CI 3.13 to 4.14) in men vs 2.28 (95% CI 2.28 to 3.14) in women; PR for suicidal ideation: 2.17 (95% CI 1.92 to 2.46) in men vs 2.08 (95% CI 1.81 to 2.40) in women).

Other risk factors for mental health outcomes

In men, younger age, not having a partner, low household income (lower than ¥3.99 million), working from home since before the pandemic, starting to work from home during the pandemic, increased physical or psychological demands during the pandemic and current or prior history of depression were significantly and independently associated with both severe psychological distress and suicidal ideation in the workplace bullying adjusted model (table 4). In women, similar trends were observed, but working from home was not associated with

Table 3 Workplace bullying and mental health outcomes: modified Poisson regression analysis

	Severe psychological distress			Suicidal ideation		
	Case/all (%)	PRs (95% CI) Model 1	PRs (95% CI) Model 2	Case/all (%)	PRs (95% CI) Model 1	PRs (95% CI) Model 2
All (N=16 384)						
Not exposed or witnessed	761/12 869 (5.9)	1.00 (reference)	1.00 (reference)	1,182/12 869 (9.2)	1.00 (reference)	1.00 (reference)
Not exposed but witnessed	135/1074 (12.6)	**2.01 (1.69 to 2.38)**	**1.90 (1.60 to 2.25)**	150/1074 (14.0)	**1.48 (1.26 to 1.72)**	**1.41 (1.20 to 1.64)**
Exposed	546/2441 (22.4)	**3.30 (2.98 to 3.66)**	**2.84 (2.55 to 3.15)**	558/2441 (22.9)	**2.23 (2.03 to 2.45)**	**2.13 (1.94 to 2.34)**
Men (N=9565)						
Not exposed or witnessed	365/7361 (5.0)	1.00 (reference)	1.00 (reference)	593/7361 (8.1)	1.00 (reference)	1.00 (reference)
Not exposed but witnessed	81/646 (12.5)	**2.30 (1.83 to 2.90)**	**2.22 (1.77 to 2.80)**	92/646 (14.2)	**1.67 (1.37 to 2.04)**	**1.58 (1.29 to 1.93)**
Exposed	357/1588 (22.5)	**3.69 (3.21 to 4.25)**	**3.60 (3.13 to 4.14)**	340/1588 (21.4)	**2.27 (2.01 to 2.57)**	**2.17 (1.92 to 2.46)**
Women (N=6789)						
Not exposed or witnessed	396/5508 (7.2)	1.00 (reference)	1.00 (reference)	589/5508 (10.7)	1.00 (reference)	1.00 (reference)
Not exposed but witnessed	54/428 (12.6)	**1.72 (1.33 to 2.22)**	**1.65 (1.28 to 2.13)**	58/428 (13.6)	1.26 (0.99 to 1.61)	1.21 (0.95 to 1.54)
Exposed	189/853 (22.2)	**2.81 (2.40 to 3.30)**	**2.28 (2.28 to 3.14)**	218/6789 (12.7)	**2.19 (1.91 to 2.53)**	**2.08 (1.81 to 2.40)**

Model 1: Adjusted for individual characteristics (gender, age, residential area and having a partner), SES (education, household income and employment status) and occupational characteristics (industry, office size and job type).
Model 2: In addition to model 1, prior history of depression was adjusted.
Bold values show statistically significant results.
PRs, prevalence ratios; SES, socioeconomic status.

either severe psychological distress or suicidal ideation (table 5).

DISCUSSION

In this nationwide internet survey for the general working population, 15% of workers experienced workplace bullying, 9% had severe psychological distress and 12% had suicidal ideation during the second and third wave of the COVID-19 pandemic in Japan (April–September 2020). Our results showed younger age, low household income, increased physical demands, increased psychological demands and a prior history of depression were common significant risk factors for workplace bullying, severe psychological distress and suicidal ideation. Although this pattern is similar to the trend before the pandemic,[7 9] a different pattern was also observed in this study: men and workers with higher occupational positions such as executives, managers or permanent workers had a higher risk of bullying than women or part-time workers. As workload has been reported as an antecedent to bullying,[7 14–16] COVID-19-related working environment changes, such as an increase in physical or psychological demands, may affect the findings. A new work style—working from home—was also associated with adverse mental health; however, starting to work from home was found to be a preventive factor against workplace bullying. This indicates that working from home has both advantages and disadvantages; although working from home contributes to a decrease in aggressive and negative acts from supervisors or coworkers, it isolates workers due to lack of social interaction.[25] This may contribute to psychological distress because the amount of social support also decreases.[24] Overall, the results of this study suggest that when designing interventions to prevent workplace bullying or mental health problems among workers, we should focus not only on previously reported

Table 4 Risk factors for mental health outcomes among men (N=9565): modified Poisson regression analysis

		Severe psychological distress			Suicidal ideation		
	All	Case	%	PRs (95% CI)*	Case	%	PRs (95% CI)*
Age							
Under 24	512	94	18.4	**5.80 (3.40 to 9.87)**	119	23.2	**4.38 (2.98 to 6.45)**
25–34	1659	221	13.3	**5.41 (3.26 to 8.98)**	240	14.5	**3.44 (2.39 to 4.95)**
35–44	2112	212	10.0	**4.90 (2.98 to 8.08)**	269	12.7	**3.46 (2.43 to 4.93)**
45–54	2431	196	8.1	**4.11 (2.50 to 6.76)**	258	10.6	**2.93 (2.06 to 4.16)**
55–64	1816	63	3.5	**2.00 (1.17 to 3.40)**	103	5.7	**1.71 (1.18 to 2.49)**
Over 65	1065	17	1.6	1.00 (reference)	36	3.4	1.00 (reference)
Having a partner/spouse							
Yes	6093	369	6.1	1.00 (reference)	464	7.6	1.00 (reference)
No	3502	434	12.4	**1.35 (1.16 to 1.57)**	561	16.0	**1.37 (1.20 to 1.56)**
Residential area							
Prefecture under special precautions	6008	526	8.8	1.09 (0.95 to 1.25)	662	11.0	1.05 (0.93 to 1.19)
Other	3587	277	7.7	1.00 (reference)	363	10.1	1.00 (reference)
Education							
High school or below	2246	179	8.0	0.93 (0.78 to 1.10)	249	11.1	0.97 (0.84 to 1.13)
Junior college/vocational school	1360	112	8.2	0.91 (0.74 to 1.11)	158	11.6	1.00 (0.84 to 1.18)
University or above	5989	512	8.5	1.00 (reference)	618	10.3	1.00 (reference)
Annual household income during the previous year (million yen)							
Unknown	1241	66	5.3	0.75 (0.55 to 1.02)	100	8.1	1.04 (0.79 to 1.37)
1.99 or less	450	86	19.1	**1.87 (1.39 to 2.52)**	117	26.0	**2.40 (1.82 to 3.17)**
2.00–3.99	1592	185	11.6	**1.39 (1.08 to 1.81)**	234	14.7	**1.66 (1.30 to 2.13)**
4.00–5.99	2177	175	8.0	1.01 (0.79 to 1.29)	241	11.1	**1.38 (1.09 to 1.74)**
6.00–7.99	1602	120	7.5	1.05 (0.81 to 1.36)	140	8.7	1.21 (0.94 to 1.56)
8.00–9.99	1164	80	6.9	0.98 (0.75 to 1.30)	102	8.8	1.25 (0.96 to 1.63)
10.00 or more	1369	91	6.6	1.00 (reference)	91	6.6	1.00 (reference)
Occupation/employment status							
Executive	733	68	9.3	1.01 (0.72 to 1.41)	77	10.5	0.88 (0.65 to 1.18)
Self-employed/individual business owner	1144	79	6.9	1.33 (0.92 to 1.92)	120	10.5	0.998 (0.72 to 1.38)
Family business assistance	69	15	21.7	**2.34 (1.46 to 3.76)**	12	17.4	1.05 (0.62 to 1.78)
Manager	1699	111	6.5	0.77 (0.55 to 1.07)	133	7.8	0.74 (0.56 to 0.97)
Permanent worker (non-manager)	4568	423	9.3	0.79 (0.60 to 1.05)	516	11.3	0.76 (0.60 to 0.95)
Agency worker	142	17	12.0	0.93 (0.57 to 1.51)	27	19.0	1.05 (0.72 to 1.43)
Contract worker	598	31	5.2	0.72 (0.48 to 1.09)	51	8.5	0.78 (0.57 to 1.07)
Part-time worker	642	59	9.2	1.00 (reference)	89	13.9	1.00 (reference)
Industry							
Public administration	771	73	9.5	1.00 (reference)	69	8.9	1.00 (reference)
Agriculture, forestry and fishing	134	19	14.2	1.32 (0.84 to 2.07)	19	14.2	1.30 (0.82 to 2.08)
Construction	623	37	5.9	0.75 (0.51 to 1.11)	55	8.8	0.98 (0.69 to 1.39)
Manufacturing	2069	182	8.8	1.03 (0.77 to 1.37)	206	10.0	0.97 (0.73 to 1.30)
Electricity, gas and water supply	173	16	9.2	0.93 (0.55 to 1.58)	24	13.9	1.28 (0.80 to 2.02)
Telecommunication	649	50	7.7	0.88 (0.61 to 1.28)	78	12.0	1.15 (0.82 to 1.60)
Transport	523	38	7.3	0.81 (0.55 to 1.20)	66	12.6	1.13 (0.80 to 1.60)

Continued

Table 4 Continued

		Severe psychological distress			Suicidal ideation		
	All	**Case**	**%**	**PRs (95% CI)***	**Case**	**%**	**PRs (95% CI)***
Wholesale	376	33	8.8	1.09 (0.75 to 1.61)	43	11.4	1.23 (0.85 to 1.79)
Retail trade	538	39	7.2	0.93 (0.63 to 1.37)	60	11.2	1.12 (0.78 to 1.60)
Finance	239	12	5.0	0.66 (0.36 to 1.19)	16	6.7	0.73 (0.43 to 1.23)
Insurance	139	11	7.9	1.09 (0.96 to 2.01)	10	7.2	0.87 (0.45 to 1.68)
Real estate	261	16	6.1	0.97 (0.57 to 1.63)	24	9.2	1.22 (0.77 to 1.94)
Restaurants	170	23	13.5	1.29 (0.83 to 2.00)	26	15.3	1.13 (0.72 to 1.75)
Hotels	68	7	10.3	0.95 (0.47 to 1.92)	9	13.2	1.13 (0.61 to 2.11)
Healthcare	414	39	9.4	1.08 (0.73 to 1.58)	43	10.4	1.30 (0.70 to 1.52)
Welfare	270	24	8.9	0.97 (0.62 to 1.53)	32	11.9	1.06 (0.70 to 1.61)
Education and learning assistance	402	35	8.7	0.97 (0.67 to 1.40)	44	10.9	1.20 (0.84 to 1.72)
Other	1776	149	8.4	1.02 (0.76 to 1.35)	201	11.3	1.09 (0.81 to 1.46)
Office size							
1–4	1462	94	6.4	1.00 (reference)	154	10.5	1.00 (reference)
5–29	1569	121	7.7	1.22 (0.90 to 1.65)	170	10.8	0.96 (0.74 to 1.25)
30–49	615	46	7.5	1.18 (0.78 to 1.74)	55	8.9	0.80 (0.57 to 1.12)
50–99	892	89	10.0	1.47 (1.06 to 2.03)	104	11.7	1.01 (0.76 to 1.36)
100–299	1280	122	9.5	1.33 (0.897 to 1.83)	151	11.8	0.998 (0.75 to 1.33)
300–499	602	60	10.0	1.36 (0.94 to 1.97)	74	12.3	1.03 (0.75 to 1. 3)
500–999	640	62	9.7	**1.47 (1.03 to 2.11**)	73	11.4	1.06 (0.76 to 1.47)
Over 1000	2094	169	8.1	1.24 (0.90 to 1.72)	210	10.0	0.96 (0.72 to 1.27)
Government office	441	40	9.1	1.39 (0.91 to 2.13)	34	7.7	0.79 (0.51 to 1.23)
Job type							
Desk based	4795	395	8.2	1.00 (reference)	492	10.3	1.00 (reference)
Working with people	2145	200	9.3	1.01 (0.85 to 1.19)	233	10.9	0.93 (0.79 to 1.08)
Physical work	2655	208	7.8	0.87 (0.73 to 1.04)	300	11.3	0.96 (0.83 to 1.12)
Started to work from home during the pandemic							
Yes	1973	178	9.0	**1.20 (1.01 to 1.41**)	223	11.3	**1.23 (1.06 to 1.43**)
No	7622	625	8.2	1.00 (reference)	802	10.5	1.00 (reference)
Worked from home since before the pandemic							
Yes	888	112	12.6	**1.60 (1.33 to 1.93**)	140	15.8	**1.45 (1.23 to 1.71**)
No	8707	691	7.9	1.00 (reference)	885	10.2	1.00 (reference)
Increase in physical demands							
Yes	1813	339	18.7	**2.38 (2.09 to 2.71**)	378	20.8	**1.87 (1.67 to 2.11**)
No	7782	464	6.0	1.00 (reference)	647	8.3	1.00 (reference)
Increase in psychological demands							
Yes	2930	429	14.6	**2.28 (2.00 to 2.60**)	549	18.7	**2.24 (2.00 to 2.51**)
No	6665	374	5.6	1.00 (reference)	476	7.1	1.00 (reference)
Weekly working hours during the previous month							
Less than 20 hours/week	943	90	9.5	1.00 (reference)	120	12.7	1.00 (reference)
20–29 hours/week	747	101	13.5	1.19 (0.93 to 1.52)	134	17.9	1.25 (0.996 to 1.56)
30–39 hours/week	1686	124	7.4	0.80 (0.63 to 1.03)	175	10.4	0.94 (0.76 to 1.18)
40–44 hours/week	3040	216	7.1	**0.77 (0.61 to 0.98**)	283	9.3	0.84 (0.68 to 1.03)
45–49 hours/week	1416	82	5.8	**0.65 (0.48 to 0.86**)	117	8.3	**0.76 (0. 608 to 0.98**)
50–59 hours/week	1009	97	9.6	0.97 (0.74 to 1.27)	103	10.2	0.91 (0.71 to 1.181)
Over 60 hours/week	754	93	12.3	1.15 (0.88 to 1.51)	93	12.3	0.99 (0.77 to 1.27)

Continued

Table 4 Continued

		Severe psychological distress			Suicidal ideation		
	All	Case	%	PRs (95% CI)*	Case	%	PRs (95% CI)*
History of depression							
Never	8644	544	6.3	1.00 (reference)	706	8.2	1.00 (reference)
Past	559	100	17.9	**2.16 (1.71 to 2.72)**	148	26.5	**2.70 (2.32 to 3.16)**
Current	392	159	40.6	**3.20 (2.77 to 3.69)**	171	43.6	**3.70 (3.19 to 4.29)**

Bold values show statistically significant results.
*Individual characteristics (gender, age, residential area and having a partner), SES (education, household income and employment status), occupational characteristics (industry, office size and job type), workplace bullying and a prior history of depression adjusted.
PRs, prevalence ratios; SES, socioeconomic status.

vulnerable workers but also those whose work style or job demands have changed.

The prevalence of workplace bullying in this study was similar to the global prevalence before the pandemic.[2] Although higher than previously reported in the representative working sample in Japan (6.1%),[9] it does not necessarily mean that more workers experienced bullying during the pandemic because the measurement durations are different. The previous study measured experiencing workplace bullying during the previous month, but this study measured the previous 6 months. Measurement methods greatly contributed to the prevalence rates of workplace bullying.[2] As a recent national survey of workplace bullying and harassment in Japan showed a non-different prevalence of workplace bullying in 2020 (31.4%) and in 2016 (32.5%), the prevalence itself may not have changed before and during the pandemic in Japan.

In this study, younger workers, workers with lower household income, executives, managers, permanent workers, those working in larger sized offices, those experiencing increased physical or psychological demands, and those with current or prior history of depression or other mental illnesses were more likely to be exposed to workplace bullying. Although the results are mostly consistent with previous studies,[3 6 7 9 14 15] inconsistent results were observed in terms of occupational positions[10]; executives and managers had a higher risk of experiencing workplace bullying compared with women and part-time workers. This trend may be caused by the pandemic, since an increase in physical or psychological demands was also associated with exposure to bullying in this study. During the pandemic, managers had responsibility for implementing countermeasures to protect employees against COVID-19. At the same time, they had to follow government guidelines against COVID-19, which may have decreased their job autonomy or control.[15] Moreover, during the pandemic, executives and managers had to adapt new technologies such as online meetings or new work practices including working from home.[19] Since most executives and managers were unlikely to have had expertise in infection control or new technologies, their subordinates' frustration may have increased and led to aggressive behaviour toward managers.[36] A study of managers has reported that the risk for exposure to bullying was higher in those who suffered from work stress, were less satisfied with their salary, and could not see opportunities for promotion within their organisation.[11] Managers in Japan have been reported as highly stressed workers since most are middle managers with heavy workloads and limited autonomy, often described as 'player managers' (managers who are part of a team as well as its manager).[37] This may also contribute to the high prevalence of workplace bullying we found among managers.

Interestingly, men were more likely to be exposed to workplace bullying than women. Previous studies have shown the opposite results: women are at higher risk for workplace bullying than men.[38] In general, perpetrators of workplace bullying are mainly managers and males. In Japan, most manager positions are dominated by men. A recent national survey has reported that women occupy only 13.2% of managerial positions in 2021. In other words, 86.8% of managers are men. Since men tend to be bullied by other men, the gender imbalance of managers in Japan might have caused a higher risk of men in the prevalence of workplace bullying.

Exposure to workplace bullying was significantly associated with severe psychological distress and suicidal ideation in both men and women, even after adjusting for individual characteristics, SES, occupational characteristics and a prior history of depression. This indicates a strong relationship between bullying and mental health problems, as previously shown.[3–5 39] Moreover, we found that witnessing bullying was also associated with both severe psychological distress and suicidal ideation. This is in line with a longitudinal study which showed a spillover effect of workplace bullying on non-victims' psychological distress.[39]

Men were more likely to have severe psychological distress or suicidal ideation than women as a result of bullying. Although gender differences have not been investigated in the meta-analyses on the association between bullying and mental health,[3–5] the results of this study are consistent with a study of the association between work-related physical violence and depression in Japan.[40] Two possible explanations are considered. First, men were more likely to be in managerial positions

Table 5 Risk factors for mental health outcomes among women (N=6789): modified Poisson regression analysis

		Severe psychological distress			Suicidal ideation		
	All	Case	%	PRs (95% CI)*	Case	%	PRs (95% CI)*
Age							
Under 24	512	88	17.2	**3.92 (2.43 to 6.34)**	111	21.7	**2.87 (1.95 to 4.21)**
25–34	1305	163	12.5	**3.33 (2.11 to 5.25)**	198	15.2	**2.26 (1.58 to 3.24)**
35–44	1561	175	11.2	**3.08 (1.97 to 4.84)**	233	14.9	**2.18 (1.53 to 3.09)**
45–54	1715	135	7.9	**2.24 (1.42 to 3.53)**	201	11.7	**1.79 (1.26 to 2.55)**
55–64	1098	57	5.2	1.51 (0.93 to 2.45)	83	7.6	1.22 (0.83 to 1.79)
Over 65	598	21	3.5	1.00 (reference)	39	6.5	1.001.00 (reference)
Having a partner/spouse							
Yes	3540	258	7.3	1.00 (reference)	338	9.5	1.00 (reference)
No	3249	381	11.7	**1.23 (1.03 to 1.47)**	527	16.2	**1.24 (1.06 to 1.46)**
Residential area							
Prefecture under special precautions	4238	402	9.5	1.01 (0.86 to 1.17)	517	12.2	0.91 (0.80 to 1.03)
Other	2551	237	9.3	1.00 (reference)	348	13.6	1.00 (reference)
Education							
High school or below	1921	184	9.6	1.03 (0.85 to 1.24)	257	13.4	0.98 (0.82 to 1.17)
Junior college/ vocational school	2298	184	8.0	0.86 (0.72 to 1.04)	278	12.1	1.00 (0.85 to 1.19)
University or above	2570	271	10.5	1.00 (reference)	330	12.8	1.00 (reference)
Annual household income during the previous year (million yen)							
Unknown	1411	128	9.1	1.31 (0.94 to 1.83)	176	12.5	1.27 (0.93 to 1.74)
1.99 or less	537	73	13.6	**1.59 (1.10 to 2.31)**	107	19.9	**1.49 (1.05 to 2.12)**
2.00–3.99	1461	161	11.0	**1.43 (1.04 to 1.98)**	241	16.5	**1.58 (1.16 to 2.14)**
4.00–5.99	1292	120	9.3	1.37 (0.99 to 1.89)	151	11.7	1.25 (0.91 to 1.72)
6.00–7.99	879	76	8.6	1.28 (0.90 to 1.82)	90	10.2	1.15 (0.82 to 1.62)
8.00–9.99	580	38	6.6	1.08 (0.72 to 1.63)	46	7.9	0.93 (0.62 to 1.38)
10.00 or more	629	43	6.8	1.00 (reference)	54	8.6	1.00 (reference)
Occupation/employment status							
Executive	194	27	13.9	1.17 (0.81 to 1.69)	31	16.0	0.91 (0.62 to 1.34)
Self-employed/ individual business owner	404	29	7.2	0.97 (0.64 to 1.48)	45	11.1	0.94 (0.65 to 1.36)
Family business assistance	141	19	13.5	**1.79 (1.12 to 2.87)**	15	10.6	0.79 (0.45 to 1.38)
Manager	315	30	9.5	0.87 (0.60 to 1.27)	37	11.7	0.75 (0.52 to 1.07)
Permanent worker (non-manager)	2633	256	9.7	0.88 (0.71 to 1.09)	311	11.8	**0.72 (0.60 to 0.87)**
Agency worker	224	30	13.4	1.33 (0.93 to 1.89)	37	16.5	0.98 (0.68 to 1.41)
Contract worker	464	44	9.5	0.96 (0.70 to 1.33)	65	14.0	0.89 (0.68 to 1.18)
Part-time worker	2414	204	8.5	1.00 (reference)	324	13.4	1.00 (reference)
Industry							
Public administration	294	32	10.9	1.00 (reference)	34	11.6	1.00 (reference)
Agriculture, forestry and fishing	47	7	14.9	1.19 (0.57 to 2.48)	10	21.3	**2.00 (1.10 to 3.64)**
Construction	285	25	8.8	0.73 (0.45 to 1.19)	41	14.4	1.31 (0.85 to 2.00)
Manufacturing	679	49	7.2	**0.57 (0.37 to 0.88)**	78	11.5	1.03 (0.69 to 1.52)
Electricity, gas and water supply	62	5	8.1	0.51 (0.21 to 1.24)	13	21.0	1.56 (0.87 to 2.81)

Continued

Table 5 Continued

		Severe psychological distress			Suicidal ideation		
	All	Case	%	PRs (95% CI)*	Case	%	PRs (95% CI)*
Telecommunication	195	20	10.3	0.68 (0.41 to 1.14)	22	11.3	0.90 (0.54 to 1.50)
Transport	161	19	11.8	0.98 (0.58 to 1.66)	31	19.3	1.71 (1.08 to 2.70)
Wholesale	195	20	10.3	0.73 (0.44 to 1.22)	21	10.8	0.87 (0.53 to 1.45)
Retail trade	731	71	9.7	0.85 (0.57 to 1.29)	100	13.7	1.12 (0.76 to 1.65)
Finance	184	18	9.8	0.74 (0.43 to 1.29)	23	12.5	1.12 (0.67 to 1.86)
Insurance	149	10	6.7	0.55 (0.27 to 1.12)	16	10.7	0.99 (0.56 to 1.75)
Real estate	135	12	8.9	0.74 (0.40 to 1.36)	16	11.9	1.09 (0.63 to 1.89)
Restaurants	338	49	14.5	1.09 (0.71 to 1.69)	62	18.3	1.26 (0.83 to 1.90)
Hotels	83	8	9.6	0.67 (0.32 to 1.43)	11	13.3	0.99 (0.52 to 1.88)
Healthcare	787	71	9.0	0.79 (0.53 to 1.18)	83	10.5	0.99 (0.67 to 1.47)
Welfare	434	33	7.6	0.71 (0.44 to 1.14)	71	16.4	1.51 (1.02 to 2.23)
Education and learning assistance	451	38	8.4	0.83 (0.54 to 1.29)	36	8.0	0.76 (0.48 to 1.18)
Other	1579	152	9.6	0.79 (0.55 to 1.15)	197	12.5	1.02 (0.71 to 1.47)
Office size							
1–4	917	94	6.4	1.00 (reference)	154	10.5	1.00 (reference)
5–29	1672	121	7.7	0.87 (0.65 to 1.17)	170	10.8	0.94 (0.74 to 1.20)
30–49	546	46	7.5	0.99 (0.70 to 1.40)	55	8.9	1.10 (0.83 to 1.46)
50–99	733	89	10.0	0.90 (0.63 to 1.27)	104	11.7	0.90 (0.67 to 1.20)
100–299	865	122	9.5	0.88 (0.63 to 1.23)	151	11.8	0.84 (0.63 to 1.12)
300–499	397	60	10.0	1.26 (0.87 to 1.82)	74	12.3	1.18 (0.85 to 1.63)
500–999	425	62	9.7	0.96 (0.66 to 1.40)	73	11.4	0.90 (0.64 to 1.26)
Over 1000	1064	169	8.1	1.01 (0.73 to 1.41)	210	10.0	0.99 (0.75 to 1.30)
Government office	170	40	9.1	0.57 (0.29 to 1.11)	34	7.7	1.09 (0.66 to 1.78)
Job type							
Desk based	3149	395	8.2	1.00 (reference)	492	10.3	1.00 (reference)
Working with people	1879	200	9.3	0.86 (0.72 to 1.04)	233	10.9	0.97 (0.82 to 1.14)
Physical work	1761	208	7.8	0.82 (0.66 to 1.01)	300	11.3	0.86 (0.71 to 1.02)
Started to work from home during the pandemic							
Yes	991	178	9.0	1.15 (0.94 to 1.40)	223	11.3	0.97 (0.81 to 1.18)
No	5798	625	8.2	1.00 (reference)	802	10.5	1.00 (reference)
Working from home since before the pandemic							
Yes	494	112	12.6	1.28 (0.99 to 1.65)	140	15.8	1.13 (0.89 to 1.43)
No	6295	691	7.9	1.00 (reference)	885	10.2	1.00 (reference)
Increase in physical demands							
Yes	1576	265	16.8	**2.14 (1.84 to 2.50)**	338	21.4	**1.84 (1.62 to 2.08)**
No	5213	374	7.2	1.00 (reference)	527	10.1	1.00 (reference)
Increase in psychological demands							
Yes	2491	411	16.5	**2.86 (2.44 to 3.34)**	510	20.5	**2.18 (1.92 to 2.47)**
No	4298	228	5.3	1.00 (reference)	355	8.3	1.00 (reference)
Weekly working hours during the previous month							
Less than 20 hours/week	1745	168	9.6	1.00 (reference)	222	12.7	1.00 (reference)
20–29 hours/week	1074	94	8.8	0.86 (0.67 to 1.08)	151	14.1	1.03 (0.85 to 1.23)
30–39 hours/week	1417	124	8.8	0.81 (0.64 to 1.02)	165	11.6	0.92 (0.76 to 1.11)
40–44 hours/week	1636	145	8.9	**0.74 (0.58 to 0.95)**	201	12.3	0.90 (0.74 to 1.10)
45–49 hours/week	484	59	12.2	1.02 (0.75 to 1.37)	72	14.9	1.07 (0.82 to 1.39)

Continued

Table 5 Continued

		Severe psychological distress			Suicidal ideation		
	All	Case	%	PRs (95% CI)*	Case	%	PRs (95% CI)*
50–59 hours/week	256	34	13.3	1.22 (0.84 to 1.76)	32	12.5	0.99 (0.69 to 1.41)
Over 60 hours/week	177	15	8.5	0.71 (0.43 to 1.16)	22	12.4	0.91 (0.62 to 1.34)
History of depression							
Never	6138	449	7.3	1.00 (reference)	609	9.9	1.00 (reference)
Past	430	99	23.0	**2.58 (2.13 to 3.13)**	136	31.6	**2.72 (2.32 to 3.18)**
Current	221	91	41.2	**4.06 (3.33 to 4.93)**	120	54.3	**4.06 (3.47 to 4.75)**

Bold values show statistically significant results.
*Individual characteristics (gender, age, residential area and having a partner), SES (education, household income and employment status), occupational characteristics (industry, office size and job type), workplace bullying and a prior history of depression adjusted.
CI, confidence interval; PRs, prevalence ratios; SES, socioeconomic status.

than women. The high prevalence of workplace bullying observed in executives and managers in this study may affect the high prevalence of severe psychological distress or suicidal ideation in men. The second possible explanation is low psychological preparedness, which refers to a sense of control over trauma.[41] Since men had a lower risk of workplace bullying before the pandemic, experiencing such behaviour may have been more shocking and led to more severe mental health problems than for women who have a higher risk for bullying in general.[7 8]

In this study, newly starting working from home was a preventive factor against workplace bullying but was a predictor for adverse mental health outcomes. As noted previously, there are advantages and disadvantages to working from home: while interaction with potential bullies is decreased, social support from coworkers is also decreased and this may contribute to a deterioration of mental health.[24] In this study, although working from home since before the pandemic was associated with both severe psychological distress and suicidal ideation, newly initiated working from home was associated with only suicidal ideation. This is consistent with a study which reported long-term working from home reduced communication with, or support from, coworkers.[24 25] Thus, these results highlight the importance of retaining social support for remote workers and monitoring their mental health.

We found younger age, not having a partner, lower household income, increased physical demands, increased psychological demands and a prior history of depression were risk factors for severe psychological distress and suicidal ideation both in men and women, in addition to workplace bullying. Although the existing literature has shown a significant association between job demands and mental health,[42] the findings of this study show the effects of changes in job demands may also affect severe psychological distress or suicidal ideation during a pandemic.

Several limitations should be noted. First, this study was cross-sectional, so that causality cannot be determined. Although we adjusted for a prior history of depression to avoid reverse causality, a longitudinal study is needed to clarify the association between risk factors and workplace bullying, severe psychological distress and suicidal ideation in the COVID-19 pandemic. Second, workplace bullying was measured by a self-labelling method, which may cause underestimation compared with the behavioural experience method that asks respondents how often they experienced various negative acts without using the term 'harassment' or 'bullying'.[2] This underestimation might have caused gender difference in prevalence of workplace bullying, for example, women may not have realised that they were bullied. In addition, we did not ask the gender distribution in the workplace. Such working environment factors may influence the experience of workplace bullying. Third, there might be a sampling bias due to the nature of online surveys. In this study, the recruitment process stopped once the target number of participants answered the questionnaire, which means that our sample comprised early responders who may have been people with more time available to them. Seriously bullied persons or highly stressed people may not have participated in this study, which might have caused an underestimation of the prevalence of workplace bullying or mental health outcomes. Moreover, recall bias would also have occurred, since we asked the participants about bullying experiences during the previous 6 months. This may limit the generalisability of our study results.

Despite these limitations, this study was the first to identify important risk factors for workplace bullying, severe psychological distress and suicidal ideation in a large-scale nationwide study for the general working population in Japan. The strength of this study was the identification of various new risk factors, including working from home, for severe psychological distress or suicidal ideation, and an increased risk of workplace bullying for managers. Further research is needed to examine other possible risk factors for workplace bullying, severe psychological distress and suicidal ideation in a longitudinal design.

CONCLUSIONS

Overall, 15% of workers experienced workplace bullying, 9% had severe psychological distress and 12% had suicidal ideation during the second and third wave of the COVID-19 pandemic in Japan. The results of this study showed men, executives, managers and permanent workers were at a higher risk of bullying than women or part-time workers. Increased physical or psychological demands were common risk factors for bullying, severe psychological distress and suicidal ideation. Newly starting working from home was a significant predictor for adverse mental health outcomes, but was also found to be a preventive factor against workplace bullying. The results of this study show that the pattern of high-risk groups changed during the pandemic. Interventions to decrease workplace bullying or mental health problems should focus on new high-risk groups or workers who experienced a change of work styles or job demands, in addition to previously reported vulnerable workers.

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Data availability statement Data are available on reasonable request. The data used in this study are not available in a public repository because they contain personally identifiable or potentially sensitive patient information. Based on the regulations for ethical guidelines in Japan, the Research Ethics Committee of the Osaka International Cancer Institute has imposed restrictions on the dissemination of the data collected in this study. All data inquiries should be addressed to the person responsible for data management, TT, at the following email address: tabuchitak@gmail.com.

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