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Occupational Factors Associated with Telemedicine Use in the Japanese Working-Age Population: A Web-Based Study Conducted during the COVID-19 Pandemic

Hiromichi Ueno,[1] Tomohiro Ishimaru,[2] Ryutaro Matsugaki,[3] Hajime Ando,[4] Kosuke Mafune,[5] Tomohisa Nagata,[6] Seiichiro Tateishi,[7] Mayumi Tsuji,[8] Yoshihisa Fujino[2] and for the CORoNaWork Project

[1]Department of the Second Department of Internal Medicine, School of Medicine, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[2]Department of Environmental Epidemiology, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[3]Department of Preventive Medicine and Community Health, School of Medicine, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[4]Department of Work Systems and Health, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[5]Department of Mental Health, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[6]Department of Occupational Health Practice and Management, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[7]Department of Occupational Medicine, School of Medicine, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan
[8]Department of Environmental Health, School of Medicine, University of Occupational and Environmental Health, Japan, Kitakyushu, Fukuoka, Japan

Telemedicine has significant potential for helping workers access medical treatment. To improve workers' access to telemedicine, it is important to analyze current utilization rates and influencing factors. Therefore, the purpose of this study is to evaluate the associations between occupational factors and telemedicine use. A 1-year follow-up study of 4,882 full-time workers receiving regular treatment in Japan was conducted from December 2020 to December 2021. Occupational factors associated with the use of telemedicine were evaluated by multivariate logistic regression analysis. In total, 191 participants had experience of using telemedicine (3.9%). The most common comorbidity was hypertension (37.0%), followed by back pain and arthritis (19.8%) and depression and psychiatric disorders (14.5%). Managers and executives [adjusted odds ratio (aOR) = 1.92, 95% confidence interval (CI): 1.68-3.43, P < = 0.026], finance industry workers (aOR = 2.61, 95% CI: 1.24-5.49, P = 0.011), and individuals with experience of teleworking (aOR = 2.08, 95% CI: 1.52-2.85, P < 0.001) were more likely to use telemedicine. Telemedicine usage was least common among workers aged 50-59 years (aOR = 0.35, 95% CI: 0.22-0.57, P < 0.001) and those with long working hours (≥ 9.0 hours/day) (aOR = 0.59, 95% CI: 0.38-0.93, P < 0.022). The utilization rate of telemedicine in Japan is still low. This study identified occupational factors related to the use of telemedicine, such as worker's age, employee status, working hours, and experience of teleworking. Our findings suggest that flexible work arrangements could promote widespread use of telemedicine.

Keywords: COVID-19; occupational health; telehealth; telemedicine; workers
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Correspondence: Tomohiro Ishimaru, M.D., M.P.H., Ph.D., Department of Environmental Epidemiology, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Japan, 1-1 Iseigaoka, Yahata-nishi-ku, Kitakyushu, Fukuoka 807-8555, Japan.
e-mail: ishimaru@med.uoeh-u.ac.jp

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has dramatically changed the nature of medical care, including telemedicine. Lockdowns and "stay at home" recommendations have made it difficult for physicians to continue to offer patients traditional face-to-face medical care (Baum et al. 2021). To cope with this problem, the use of telemedicine was promoted worldwide (World Health Organization 2020). In Japan, telemedicine was officially approved as a medical option in 1997, but for a long time its use was limited to special situations such as the remote island setting (Kadoya et al. 2020). However, during the COVID-19 pandemic, the Japanese government promoted wider use of telemedicine.

Despite the efforts of the government, telemedicine is not in widespread use in Japan, even in the era of the COVID-19 pandemic. Miyawaki et al. (2021) reported that the use rate of telemedicine in Japan increased from 2.0% in April 2020 to 4.7% in September 2020. Obstacles to telemedicine provision reported by physicians include legal restrictions, fixed investment costs, technological issues, privacy concerns, and limited capacity to gather information compared with face-to-face consultations (Scott Kruse et al. 2018; Shimizu et al. 2021). In terms of limiting patient factors, belonging to an ethnic minority group, residing in a rural area, low education level, and elderly status have all been cited (Lam et al. 2020; Yang et al. 2021). The key to widespread use of telemedicine, as with other medical services, is the development of communication tools and maturation of people's understanding of the technology (Ishimaru et al. 2021). It is also important to develop a legal framework for providing telemedicine (Kinoshita et al. 2020).

Telemedicine has the potential to help workers access medical treatment. For example, if a patient is unable to visit the hospital due to busy work schedule, telemedicine will make it easier for them to receive medical care. To improve worker access to telemedicine, it is important to analyze their utilization characteristics. In Japan, patients with higher education and income levels, and those residing in urban areas, are more likely to use telemedicine (Miyawaki et al. 2021). However, few reports have investigated the relationship between occupational factors and telemedicine. Therefore, the purpose of this study is to evaluate the associations between occupational factors and telemedicine use among Japanese employees.

Materials and Methods

Study population

We retrieved data from the Collaborative Online Research on the Novel-coronavirus and Work (CORoNaWork) project. In brief, a 1-year follow-up study was conducted, which enrolled full-time workers aged 20-65 years who registered with an online survey company. Details of the study population were published elsewhere (Fujino et al. 2021). In December 2020, the CORoNaWork project baseline survey enrolled 27,036 participants, 18,560 of whom completed the 1-year follow-up survey (response rate = 68.6%). We excluded participants who indicated that they were not receiving regular treatment, in either the baseline (n = 11,943) or follow-up (n = 1,735) survey. A total of 4,882 participants who were receiving regular treatment were included in the analysis.

This study was approved by the Ethics Committee of the University of Occupational and Environmental Health, Japan (approval No. R2-079). Informed consent was obtained from all participants prior to completion of the online self-administered questionnaire.

Use of telemedicine

The outcome measure was experience with telemedicine, which was determined during follow-up via the following question: "Have you regularly used an online medical service in the past year for any illnesses?" The response options were "yes" and "no".

Independent variables

The independent variables were extracted from the baseline data. On the basis of previous studies (Jaffe et al. 2020; Miyawaki et al. 2021) and discussions with the expert project members (see Acknowledgments), the following variables were defined as occupational factors or covariates: age, sex, marital status, education, work area, annual household income, employment status, industry, company size (number of employees), working hours, teleworking, and comorbidities. The age groups were 20-39, 40-49, 50-59, and 60-65 years. We requested zip codes for the places of work (Hokkaido, Tohoku, Kanto, Chubu, Kansai, Chugoku/Shikoku, Kyushu/Okinawa, or unknown). Industry was classified as public service, manufacturing, information technology, retail and wholesale, food/beverage, medical and welfare, finance, construction, or other. Employment status was classified as civil servant, permanent employee, manager or executive, dispatched or contract worker, self-employed, or other. Company size (number of employees) was classified as 1-9, 10-49, 50-999, or ≥ 1,000. Working hours were categorized as ≤ 7.5, 8.0-8.5, or ≥ 9.0. Telework was evaluated in a dichotomous manner. Regarding comorbidities, we asked the respondents whether they receive regular treatment; those who answered "yes" were required to identify the specific disease via a multiple choice item.

Statistical analysis

Multiple logistic regression analysis was performed to assess the associations between occupational factors and the use of telemedicine. As the dependent variable, the prevalence of new and existing telemedicine users was analyzed cross-sectionally. The multivariate model included age, sex, marital status, education, work area, and annual household income. The results are presented as adjusted odds ratios (aORs), 95% confidence intervals (CIs) and

two-sided P values. $P < 0.05$ was considered statistically significant. All statistical analyses were performed using Stata/SE 16.1 software (StataCorp, College Station, TX, USA).

Results

A total of 4,882 participants were eligible for the analysis. Table 1 shows the general characteristics of the study participants. In total, 191 participants had experience using telemedicine (3.9%). The 50-59 years age group was the largest (43.3%), and the 40-49 (23.3%) and 60-65 (22.9%) years age groups were almost equal in size. Approximately two-thirds of the participants were male (65.2%), more than half were married (58.7%), and more than half graduated from university or graduate school (51.3%). The industry sector employing the largest proportion of participants was manufacturing (16.7%). The largest employment status category was permanent employee (38.8%). More than 60% of the participants worked for companies with ≥ 50 employees, and the 50-999 employees company size category contained the largest proportion of participants (34.6%). More than half of the participants (55.4%) worked 8-8.5 hours per day. A quarter of the participants teleworked (24.3%). The most frequent comorbidity was hypertension (37.0%), followed by back pain and arthritis (19.8%) and depression and psychiatric disorders (14.5%). There were significant differences in age ($P < 0.001$), as well as telework ($P < 0.001$), hypertension ($P = 0.009$) and diabetes ($P = 0.017$) prevalence, between telemedicine users and non-users.

Table 2 presents the occupational factors associated with the use of telemedicine. Compared with participants aged 20-39 years, the rate of telemedicine use was significantly lower among those aged ≥ 40 years, especially in the 50-59 years group (aOR = 0.35, 95% CI: 0.22-0.57, $P < 0.001$). Participants who were married were more likely to use telemedicine than those who were single (aOR = 1.77, 95% CI: 1.19-2.63, $P = 0.005$). The rate of telemedicine use among financial industry workers was significantly higher than among public service workers (aOR = 2.61, 95% CI: 1.24-5.49, $P = 0.011$). Regarding employment status, managers and executives had higher odds of telemedicine use compared with civil servants (aOR = 1.87, 95% CI: 1.08-3.43, $P = 0.026$). Participants who worked > 9 hours/day were significantly less likely to use telemedicine than those who worked < 7.5 hours/day (aOR = 0.59, 95% CI: 0.38-0.93, $P = 0.022$). Teleworkers were about twice as likely to use telemedicine than those who did not engage in teleworking (aOR = 2.08, 95% CI: 1.52-2.85, $P < 0.001$).

Discussion

This study identified occupational factors related to the use of telemedicine, such as worker's age, employee status, working hours, and teleworking. The COVID-19 pandemic triggered an increase in the use of telemedicine worldwide (World Health Organization 2020). In Japan, telemedicine use more than doubled during the early stages of the COVID-19 pandemic, increasing from 2.0% in April 2020 to 4.7% in September 2020 (Miyawaki et al. 2021). However, we found that the use rate of telemedicine subsequently plateaued and was 3.9% in December 2021. One reason for this is the impact of mutations of the COVID-19 virus; weaker variants have enabled the resumption of face-to-face medical care. It has also been reported that factors such as the number of COVID-19 patients and lockdown policies affect the use of telemedicine (Chu et al. 2021). To improve telemedicine, it is important not only to enhance the law and communications infrastructure, but also to understand the background of each individual patient. We believe that this study has important implications regarding the dissemination of telemedicine to the working-age population of Japan and elsewhere.

Telemedicine utilization showed a U-shaped relationship with age in this study: initially, there was a gradual decline in use with age (from 7.2% in the 20-39 years age group to 3.0% in the 50-59 years age group), but the use rate subsequently increased in the 60-65 years age group (3.9%). Such a U-shaped relationship was reported in a previous Japanese study (Miyawaki et al. 2021) and there are several plausible explanations. First, younger people use electronic devices more frequently, and are more familiar with the Internet than middle-aged and older people. However, the elderly have more underlying diseases requiring regular medical examinations than the young and middle-aged (Alexander et al. 2020); the interplay between these factors may be responsible for the U-shaped relationship between the telemedicine utilization rate and age. Second, aging is the major risk factor for severe COVID-19 infection, and the desire to avoid infection among the elderly could have led to avoidance of face-to-face treatment (Gao et al. 2021). In fact, previous studies have reported that many elderly people adopted telemedicine relatively quickly during the COVID-19 pandemic (Nouri et al. 2020; Rivera et al. 2021).

The executives and managers in our study used telemedicine more proactively than civil servants. In the United States, wealthy individuals tend to have higher rates of telemedicine use (Jaffe et al. 2020; Rivera et al. 2021). Conversely, a previous Japanese study reported a weak correlation between income level and telemedicine use (Miyawaki et al. 2021). In the current study, we adjusted for income in the multivariate analysis and found no difference in telemedicine utilization rate between permanent employees and dispatched/contact workers. These findings suggest that flexible work practices among executives and managers may promote the use of telemedicine (Rodriguez Socarrás et al. 2020; Breton et al. 2021). Thus, more flexible work hours for public officers could increase their utilization of telemedicine.

The workers with long hours (≥ 9 hours/day) in this study were significantly less likely to use telemedicine than those with comparatively few hours (≤ 7.5 hours/day).

Table 1. General characteristics of the study participants.

	Total	Use of telemedicine		*P* value*
	n = 4,882	Yes n = 191	No n = 4,691	
	n (%)	n (%)	n (%)	
Age (years)				
20-39	515 (10.5)	37 (19.4)	478 (10.2)	< 0.001
40-49	1,137 (23.3)	46 (24.1)	1,091 (23.3)	
50-59	2,113 (43.3)	64 (33.5)	2,049 (43.7)	
60-65	1,117 (22.9)	44 (23.0)	1,073 (22.9)	
Sex				
Female	1,700 (34.8)	74 (38.7)	1,626 (34.7)	0.246
Male	3,182 (65.2)	117 (61.3)	3,065 (65.3)	
Marital status				
Single	1,476 (30.2)	46 (24.1)	1,430 (30.5)	0.168
Divorced or widowed	542 (11.1)	23 (12.0)	519 (11.1)	
Married	2,864 (58.7)	122 (63.9)	2,742 (58.5)	
Education				
Junior high or high school	1,361 (27.9)	47 (24.6)	1,314 (28.0)	0.202
Vocational school or college	1,018 (20.9)	34 (17.8)	984 (21.0)	
University or graduate school	2,503 (51.3)	110 (57.6)	2,393 (51.0)	
Workplace area				
Hokkaido	152 (3.1)	2 (1.0)	150 (3.2)	0.491
Tohoku	464 (9.5)	18 (9.4)	446 (9.5)	
Kanto	1,107 (22.7)	38 (19.9)	1,069 (22.8)	
Chubu	871 (17.8)	37 (19.4)	834 (17.8)	
Kansai	604 (12.4)	20 (10.5)	584 (12.4)	
Chugoku and Shikoku	570 (11.7)	24 (12.6)	546 (11.6)	
Kyushu and Okinawa	404 (8.3)	17 (8.9)	387 (8.2)	
Unknown	710 (14.5)	35 (18.3)	675 (14.4)	
Annual household income (yen)				
< 2,000,000	301 (6.2)	12 (6.3)	289 (6.2)	0.246
2,000,000-3,999,999	960 (19.7)	28 (14.7)	932 (19.9)	
4,000,000-7,999,999	2,118 (43.4)	94 (49.2)	2,024 (43.1)	
≥ 8,000,000	1,503 (30.8)	57 (29.8)	1,446 (30.8)	
Industry				
Public service	583 (8.8)	17 (6.8)	566 (8.9)	0.102
Manufacturing	1,105 (16.7)	56 (22.3)	1,049 (16.5)	
Information technology	372 (5.6)	13 (5.2)	359 (5.6)	
Retail and wholesale	410 (6.2)	13 (5.2)	397 (6.2)	
Food/beverage	302 (4.6)	11 (4.4)	291 (4.6)	
Medical and welfare	998 (15.1)	32 (12.7)	966 (15.2)	
Finance	287 (4.3)	19 (7.6)	268 (4.2)	
Construction	243 (3.7)	9 (3.6)	234 (3.7)	
Other	2,317 (35.0)	81 (32.3)	2,236 (35.1)	
Employment status				
Civil servant	656 (13.4)	19 (9.9)	637 (13.6)	0.579
Permanent employee	1,895 (38.8)	77 (40.3)	1,818 (38.8)	
Manager or executive	781 (16.0)	37 (19.4)	744 (15.9)	
Dispatched or contact worker	555 (11.4)	21 (11.0)	534 (11.4)	
Self-employed	571 (11.7)	23 (12.0)	548 (11.7)	
Other	424 (8.7)	14 (7.3)	410 (8.7)	

Company size (number of employees)				
1-9	1,122 (23.0)	34 (17.8)	1,088 (23.2)	0.200
10-49	735 (15.1)	29 (15.2)	706 (15.1)	
50-999	1,690 (34.6)	78 (40.8)	1,612 (34.4)	
≥ 1,000	1,335 (27.3)	50 (26.2)	1,285 (27.4)	
Working hours/day				
≤ 7.5	943 (19.3)	46 (24.1)	897 (19.1)	0.150
8.0-8.5	2,707 (55.4)	105 (55.0)	2,602 (55.5)	
≥ 9.0	1,232 (25.2)	40 (20.9)	1,192 (25.4)	
Teleworking				
No	3,697 (75.7)	119 (62.3)	3,578 (76.3)	< 0.001
Yes	1,185 (24.3)	72 (37.7)	1,113 (23.7)	
Comorbidities (multiple answers allowed)				
Hypertension	1,808 (37.0)	63 (33.0)	1,745 (37.2)	0.009
Diabetes	684 (14.0)	22 (11.5)	662 (14.1)	0.017
Angina and myocardial infarction	176 (3.6)	9 (4.7)	167 (3.6)	0.592
Depression and mental illness	708 (14.5)	31 (16.2)	677 (14.4)	0.167
Asthma and lung diseases	337 (6.9)	20 (10.5)	317 (6.8)	0.857
Otolaryngological disorders	432 (8.8)	22 (11.5)	410 (8.7)	0.466
Skin diseases	611 (12.5)	32 (16.8)	579 (12.3)	0.490
Low back pain and joint diseases	967 (19.8)	44 (23.0)	923 (19.7)	0.186
Gynecological disorders	372 (7.6)	19 (9.9)	353 (7.5)	0.203
Cancer	170 (3.5)	7 (3.7)	163 (3.5)	0.310

*Derived from the chi-square test.

Long hours is a major risk factor for various lifestyle-related diseases because of lifestyle disruption, high stress, and deficient sleep (Kuwahara et al. 2019; Cheng et al. 2021). Previous studies indicated that the reduced treatment access and physical burden associated with long hours were risk factors for serious physical disease (e.g., acute myocardial infarction) (Sokejima and Kagamimori 1998; Liu et al. 2002). Patients undergoing treatment for vascular or serious lifestyle-related diseases are likely to favor face-to-face treatment over telemedicine because of the need for hospital examinations. We hope that telemedicine will help workers balance work and treatment. However, this study showed that, at present, busy workers tend to lack the time required to use telemedicine. Further work reforms in Japan may be needed to increase the utilization rate of telemedicine.

In this study, the rate of telemedicine use was significantly higher among workers who had experience of teleworking. This is consistent with the findings of a Canadian study showing that teleworking promotes the use of telemedicine (Breton et al. 2021). In a previous study from our team, workers in information technology industries were more likely than workers in other industries to use COVID-19 contact tracing apps (Ishimaru et al. 2021). The psychological stress caused by telemedicine may be reduced by experience with telecommunication (i.e., telework), and the use of telemedicine may increase as telework becomes more established.

The current study had several limitations. First, the participants were workers who registered with an online survey company and responded to the 1-year follow-up survey; these participants might not be representative of typical Japanese workers. Second, we did not determine the number of telemedicine users or duration of drug prescriptions. Therefore, the cumulative incidence of telemedicine use, and the duration and effectiveness of treatment, could not be assessed. Third, we defined telemedicine use as the receipt of online medical treatment for any illness. However, as the study was conducted under the unique circumstances of the COVID-19 pandemic, different results may have been obtained by a post-COVID-19 pandemic survey. According to the Japanese government, most of the illnesses treated by telemedicine during the COVID-19 pandemic were common acute diseases (e.g., upper respiratory tract infections, bronchitis, etc.; for details, see https://www.mhlw.go.jp/content/10803000/000690548.pdf). If we only classified participants treated for acute diseases as telemedicine users, the results may have been different. However, there was no significant difference in the use rate of telemedicine between our study and previous ones, which indicates that our study design was reasonable (Miyawaki et al. 2021).

In conclusion, this study identified occupational factors associated with the use of telemedicine among the

Table 2. Occupational factors associated with the use of telemedicine.

Variable	Total	Telemedicine users		Univariate			Multivariate*		
	n	n	%	OR	(95% CI)	*P* value	OR	(95% CI)	*P* value
Age (years)									
20-39	515	37	7.2	1.00	–	–	1.00	–	–
40-49	1,137	46	4.0	0.55	(0.35-0.85)	0.007	0.51	(0.32-0.81)	0.004
50-59	2,113	64	3.0	0.40	(0.27-0.61)	< 0.001	0.35	(0.22-0.57)	< 0.001
60-65	1,117	44	3.9	0.53	(0.34-0.83)	0.005	0.43	(0.25-0.72)	0.002
Sex									
Female	1,700	74	4.4	1.00	–	–	1.00	–	–
Male	3,182	117	3.7	0.84	(0.62-1.13)	0.246	0.90	(0.63-1.29)	0.571
Marital status									
Single	1,476	46	3.1	1.00	–	–	1.00	–	–
Divorced or widowed	542	23	4.2	1.38	(0.83-2.30)	0.217	1.81	(1.06-3.07)	0.029
Married	2,864	122	4.3	1.38	(0.98-1.95)	0.064	1.77	(1.19-2.63)	0.005
Education									
Junior high or high school	1,361	47	3.5	1.00	–	–	1.00	–	–
Vocational school or college	1,018	34	3.3	0.97	(0.62-1.51)	0.880	0.92	(0.58-1.45)	0.710
University or graduate school	2,503	110	4.4	1.29	(0.91-1.82)	0.157	1.23	(0.86-1.77)	0.265
Workplace area									
Hokkaido	152	2	1.3	0.38	(0.09-1.57)	0.218*	0.39	(0.09-1.63)	0.196
Tohoku	464	18	3.9	1.14	(0.64-2.01)	0.663	1.13	(0.64-2.02)	0.672
Kanto	1,107	38	3.4	1.00	–	–	1.00	–	–
Chubu	871	37	4.2	1.25	(0.79-1.98)	0.346	1.24	(0.96-1.67)	0.366
Kansai	604	20	3.3	0.96	(0.56-1.67)	0.894	0.96	(0.55-1.67)	0.886
Chugoku and Shikoku	570	24	4.2	1.24	(0.73-2.08)	0.424	1.16	(0.69-1.97)	0.572
Kyushu and Okinawa	404	17	4.2	1.24	(0.69-2.22)	0.476	1.19	(0.66-2.15)	0.554
Unknown	710	35	4.9	1.46	(0.91-2.33)	0.113	1.40	(0.87-2.24)	0.165
Annual household income (JPY)									
< 2,000,000	301	12	4.0	1.00	–	–	1.00	–	–
2,000,000-3,999,999	960	28	2.9	0.72	(0.36-1.44)	0.355	0.67	(0.33-1.34)	0.255
4,000,000-7,999,999	2,118	94	4.4	1.12	(0.61-2.07)	0.720	0.95	(0.51-1.79)	0.882
≥ 8,000,000	1,503	57	3.8	0.95	(0.50-1.79)	0.873	0.77	(0.39-1.51)	0.443
Industry									
Public service	583	17	3.1	1.00	–	–	1.00	–	–
Manufacturing	1,105	56	4.9	1.64	(0.88-3.06)	0.116	1.68	(0.90-3.15)	0.106
Information technology	372	13	3.9	1.28	(0.57-2.87)	0.542	1.45	(0.64-3.27)	0.369
Retail and wholesale	410	13	3.8	1.25	(0.56-2.79)	0.591	1.41	(0.62-3.18)	0.411
Food/beverage	302	11	3.1	1.01	(0.40-2.54)	0.981	1.16	(0.45-2.95)	0.760
Medical and welfare	998	32	3.7	1.23	(0.64-2.35)	0.541	1.11	(0.57-2.17)	0.754
Finance	287	19	7.7	2.61	(1.25-5.46)	0.008	2.61	(1.24-5.49)	0.011
Construction	243	9	2.2	0.70	(0.23-2.17)	0.539	0.81	(0.26-2.50)	0.708
Other	2,317	81	3.6	1.17	(0.65-2.11)	0.603	1.33	(0.73-2.43)	0.355
Employment status									
Civil servant	656	19	2.9	1.00	–	–	1.00	–	–
Permanent employee	1,895	77	4.1	1.42	(0.85-2.37)	0.176	1.49	(0.88-2.51)	0.141
Manager or executive	781	37	4.7	1.67	(0.95-2.93)	0.072	1.92	(1.08-3.43)	0.026
Dispatched or contact worker	555	21	3.8	1.32	(0.70-2.48)	0.389	1.46	(0.76-2.81)	0.263
Self-employed	571	23	4.0	1.41	(0.76-2.61)	0.277	1.87	(0.97-3.59)	0.060
Other	424	14	3.3	1.15	(0.57-2.31)	0.705	1.13	(0.55-2.33)	0.746
Company size (number of employees)									
1-9	1,122	34	3.0	1.00	–	–			
10-49	735	29	3.9	1.31	(0.79-2.18)	0.287	1.16	(0.69-1.94)	0.574
50-999	1,690	78	4.6	1.55	(1.03-2.33)	0.035	1.31	(0.86-2.01)	0.215
≥ 1,000	1,335	50	3.7	1.25	(0.80-1.94)	0.331	1.05	(0.66-1.69)	0.831
Working hours/day									
≤ 7.5	943	46	4.9	1.00	–	–	1.00	–	–
8.0-8.5	2,707	105	3.9	0.79	(0.55-1.12)	0.185	0.73	(0.50-1.05)	0.086
≥ 9.0	1,232	40	3.2	0.65	(0.43-1.01)	0.053	0.59	(0.38-0.93)	0.022
Teleworking									
No	3,697	119	3.2	1.00	–	–	1.00	–	–
Yes	1,185	72	6.1	1.95	(1.44-2.63)	< 0.001	2.08	(1.52-2.85)	< 0.001

*Adjusted for age, sex, marital status, education, workplace area and annual household income.
OR, odds ratio; CI, confidence interval.

Japanese working-age population. Young workers, managers and executives, and participants who worked shorter hours or had experience of teleworking had relatively high telemedicine use rates. Currently, the number of telemedicine users in Japan is relatively low compared with other developed countries, even though the telecommunications infrastructure in Japan does not impose any constraints on the use of telemedicine. Flexible work arrangements are important for the widespread use of telemedicine, which can workers balance work and treatment, as well as help prevent the spread of infection (Dorsey et al. 2013; Wang et al. 2017; Sekimoto et al. 2019).

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The current members of the CORoNaWork Project are as follows (in alphabetical order): Dr. Akira Ogami, Dr. Ayako Hino, Dr. Hajime Ando, Dr. Hisashi Eguchi, Dr. Keiji Muramatsu, Dr. Koji Mori, Dr. Kosuke Mafune, Dr. Makoto Okawara, Dr. Mami Kuwamura, Dr. Mayumi Tsuji, Dr. Ryutaro Matsugaki, Dr. Seiichiro Tateishi, Dr. Shinya Matsuda, Dr. Tomohiro Ishimaru, and Dr. Tomohisa Nagata, Dr. Yoshihisa Fujino (chairperson of the study group), and Dr. Yu Igarashi. All members are affiliated with the University of Occupational and Environmental Health, Japan.

Author Contributions

Y.F. is the chairperson of the study group. H.U. and T.I. conceived the research questions. All of the authors contributed to the design of the research protocol and development of the questionnaire. T.I. conducted the statistical analysis. H.U. drafted the initial manuscript in collaboration with T.I. All authors revised and approved the final manuscript.

Conflict of Interest

The authors declare no conflict of interest.

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