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Workplace safety and coronavirus disease (COVID-19) pandemic: survey of employees

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Abstract

Background With the spread of COVID-19 progressively, the WHO declared the COVID-19 outbreak as pandemic on 11 Mar 2020. To inform the practical workplace policy formulation, this study explored the degree of stress level and views towards workplace supportive policy and protective equipment supply among employees.

Methods Between 17 and 27 February 2020, we interviewed 1,049 employees through online self-administered questionnaire in Hong Kong.

Findings Of respondents, 88% (923 of 1048) were stressful in the past 7 days. Eighty-four percent respondents (881 of 1048) reported different extents of workplace policies. Those who reported having workplace policy in their company were not satisfied with the arrangement and provided negative comments on its comprehensiveness (36%, 319 of 881), timeliness (38%, 337 of 881), and transparency (63%, 558 of 881). Only 68% respondents (715 of 1048) reported that their workplace supplied face masks to them. The increase in the overall self-reported stress level was significantly associated with lack of workplace policy in place, inadequate comprehensiveness, lack of timeliness, and lack of protective equipment supply. The study highlighted workplace policy should be further strengthen in both government and organization setting.

Interpretation Our findings suggest there was deficiency of workplace policy and inadequate of workplace protective equipment supply during COVID-19 pandemic and it significantly led to an increase in employee's stress. To mitigate the risk of employee exposure to COVID-19, it is important to have workplace policy from both government and organization levels to enhance workplace safety and safeguard the employee's health and well-being in the pandemic.

Introduction

The novel Coronavirus Disease 2019 (COVID-19) is a highly portable and deadly infectious disease.[1] Patients may present fever and flu-like symptoms, and some may not experience any symptoms with positive virological test or positive radiological finding of pneumonia.[2] The initial COVID-19 case was identified at the end of December 2019 in Wuhan, China, and cases are being reported in a growing number of countries internationally. As of 9 March 2020, COVID-19 has spread across seven continents and more than 110 countries: Western Pacific Region, European Region, South-East Asian Region, Eastern Mediterranean Region, Region of the Americas, and African Region with 113,702 confirmed cases and 4,012 deaths.[3] On 11 March 2020, the WHO declared the COVID-19 outbreak as pandemic [4] and it is a serious concern for public and occupational health. Evidence highlighted social mobilization plays a significant in the infectious disease spread.[5] In order to mitigate the rapid spread of COVID-19 through international contact and outbreak at local community, many jurisdictions have implemented policy interventions and public health measures to minimize the spread of COVID-19.

The Government of the Hong Kong Special Administrative Region (HK) announced the first confirmed case on 23 January 2020 and the numbers increased to 129 cases by 10 March 2020. The response level under the 'Preparedness and Response Plan for Novel Infectious Disease of Public Health Significance' (the Preparedness and Response Plan) was raised to Emergency Response Level since 26 January 2020. In addition, a series of policies and guidance were

established, including closure of certain transportation links and border checkpoints, all public areas, theme parks, and schools, in addition to surveillance at borders and quarantine policy for the suspected or close-contact cases. Subsequently, the government asked all its employees (except those providing essential/emergency services) to work from home from 28 January 2020. The announcement came in the wake of similar measures in other majority industries such as education, social service units including non-governmental organizations, and commercial offices in private sectors to adopt home offices or flexible work arrangements. A survey reported that more than 80% HK companies had implemented work-from-home arrangements,[6] but the extents were not company-wide and varied in difference industries. A proportion of companies also did not follow these at all. HK changes from vivid and energetic metropolis to static city with limited retail and catering service overnight. The practice of social distancing measures brings substantial psychological impact among employees. Numerous challenges were also involved, including failure to renew driving license and postage service.[7,8] due to the special work arrangement with the suspension or special arrangement of the public service. With increasing opinions in favour of service resumption, the government announced resumption of office duty on 27 February 2020, effective by roster system on 2 March 2020 after 33 days of special work arrangement at home.[9] Meanwhile, the stress level among employees increased due to the fear of infection after resuming work. Thus, assessment of the communication, occupational safety policy, and supporting measures in working population as part of epidemic preparedness are important in regions with elevated outbreak risk in order to identify existing gaps and improve occupational safety and viral surveillance.

The WHO has provided a series of guidelines for protection for both, health and non-health workers.[10] For non-health workplaces, six themes were suggested to ensure workplace safety during COVID-19 outbreak, including: (1) facility cleaning, (2) hand-washing, (3) respiratory hygiene, (4) national travel advice, (5) communicating and promoting the message 'stay at home even if have just mild flu-like symptoms or low-grade fever', and (6) meetings and event arrangements.[11] Simultaneously, the European Agency for Safety and Health at Work has announced the updated workplace guidance for preventing the spread of COVID-19 according to the practical information published by the WHO and the International Labour Organization, as well as the Canadian Centre for Occupational Health and Safety. This workplace guidance also includes the information on coronavirus, cleaning the infrastructure, face masks, management of confirmed COVID-19 cases, travelling and meetings, and certifying absence.[12]

Based on the experience and lessons learned from the outbreak of SARS in 2003, rapid policy and guidance seems to have resulted in a high degree of preparedness of the government for the COVID-19 pandemic and its slow spread in HK. However, there is still no study exploring views towards the practice of the suggested measures related to COVID-19 in workplaces. In the current study, the attitudes and practices concerning occupational safety in the employees in HK during the COVID-19 epidemic were explored. The findings inform policy makers in formulating practical occupational guidelines and future training concerning infectious disease control for occupational safety and allow reflecting on observed similarities and differences in the knowledge across different jurisdictions.

Methods

Study Design

An anonymous cross-sectional survey was conducted on an online platform from 17 to 27 February 2020 in HK. The study was reviewed and approved by the Survey & Behavioural Research Ethics Committee of The Chinese University of Hong Kong.

Study Sample

HK has 7·5 million people with a total labour force of 3·9 million.[13] The classification of the eight occupational groups includes: (1) managers and administrators, (2) professionals, (3) associate professionals, (4) clerical support workers, (5) service and sales workers, (6) craft and related workers, (7) plant and machine operators and assemblers, (8) elementary occupations.[13] Those who were HK residents, aged 18 years or above, working either on a full- or part-time basis, employed or self-employed, and able to understand Chinese were eligible for the survey, whereas those who were retired, housewives, and students were excluded. The respondents also needed to have an electronic device with which they could access the internet for completing the questionnaire.

Data Collection

Respondents were recruited through snowball sampling. The online self-administered questionnaire was promoted by distributing the link of the survey through email and social networking sites to reach the target population. The respondents were encouraged to forward the survey links to others. The survey was available as a Google Form. An information page was included at the beginning of the survey and respondents' consent was obtained before the completed the survey. All participation was voluntary and anonymous. Respondents could choose to withdraw from the study at any point. The collected data were stored in Google Drive and password-protected. Thus, only the researchers had the access code to login to the account for using the data for analysis.

Instruments

The questionnaire was developed based on a literature review[14] and WHO guidelines for workplace (WHO 2020d).[11] It consisted of 70 items covering the following six aspects: (1) workplace guideline and support (having guideline or supportive policy, whether the supportive policy is comprehensive, timely, and transparency), (2) personal hygiene practice and stocking of protective equipment, (3) access to information for updates on the epidemic, (4) overall self-report stress and workplace stress about self-infection with COVID-19 and family being infected, (5) health-related quality of life (HRQoL) and health status, and (6) demographics. Regarding the agreement with supportive policy at workplace, a three-point descriptive categorical scale was adopted for the response scale (not at all, some extent and good enough). A four-point Likert scale was adopted for the response scale about personal hygiene practice (never to always), whereas a five-point Likert scale was adopted for the response scale about workplace stress (not at all to the poorest status). The HK version of EQ-5D-5L (EQ-5D-5L HK) was adopted to assess the HRQoL and self-reported health status.[15] The findings on the access to information for updates on the epidemic and HRQoL would be presented in separate papers.

Statistical analysis

Data management and analysis were conducted using IBM SPSS Version 21. Descriptive information including the characteristics of respondents, organization-level measures including supportive workplace policies and individual-

level measures including personal hygiene were reported. The degree of stress level, the worries being infected and family being infected due to the work were presented as well. Chi-square or Fisher's exact tests were used when comparing the differences among the different types of occupational groups. Individual ordinal logistic regression models were applied to determine the impact of the workplace policies (accessibility to workplace policy, comprehensiveness of workplace policy, timely update on workplace policy, transparency of workplace policy and workplace supply of protective equipment) on the degree of overall stress level or workplace stress (worries being infected/ family being infected with COVID-19 due to the work) with the adjustment of age, gender and occupation. Statistical significance was considered when P-values were <0.05.

Role of funding source

The funding of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

Demographics

In total, 1196 respondents responded to the survey. Of them, 148 respondents reported that they were retired or unemployed, or did not provided their work titles; therefore, only 1048 (88%) valid responses were retained in the data analysis. Of the 1·048 respondents, a majority worked on a full-time basis (91%, 950) and in the field of 'Professionals' (43%). Among them, 68% (712 of 1048) were women, with 21% (217) aged 18-29 years, 28% (294) aged 30-39 years, 33% (345) aged 40-49 years, 16% (163) aged 50-59 years, and around 3% (28) aged 60 years and above. Regarding socio-economic characteristics, half the respondents were married or cohabited (53%, 557 of 1048), approximately 75% (787 of 1048) reported that the highest level of education attained were university graduate or post-graduate and 89% (980 of 1048) were living with their family or others (Table 1). For health condition, 14% (151 of 1048) respondents reported that they had a chronic illness. According to the HK working population statistics,[13] the recruited sample had more women, elder and fewer respondents from the occupational groups of blue-collar workers (service workers/sales/craft workers, plat/machine operators and assemblers, elementary workers, and others). Hence, the last four occupation groups were grouped as blue-collar workers and a weighed adjustment was applied to the occupational groups of study population to more accurately reflect the working population in HK.

Stress and Worries in Workplace due to COVID-19

Of respondents, 88% (923 of 1048) were stressful in the past 7 days in which 41% (377) was very to extremely stressful but no significant difference was found among occupation groups. Ninety-three percent (979 of 1048) were worried about being infected with COVID-19 in their workplace. Among them, 72% (705 of 979) were worried a bit or moderately, and nearly one-third (28%, 274 of 979) were very or extremely worried. Three occupational groups: blue-collar workers (97%), associate professionals (93%), and clerical support workers (91%) were significantly more worried (P<0·01). Majority of respondents (93%, 979 of 1048) were also worried about infecting their family with COVID-19 acquired at the workplace. The level of worry about family being infected was higher than being infected themselves; 64% (625 of 979) were worried a bit or moderately but more than one-third (36%, 354 of 979) were very

or extremely worried about this. Again, the three occupational groups of blue-collar workers (97%), clerical support workers (92%), and associate professionals (91%) were significantly more worried (P<0.01) (Table 2). Furthermore, 83% (622 of 750) respondents expressed not having any confidence in the government's policy to control the epidemic of COVID-19 whereas they had different extents of confidence in health-care professionals, in which only 6% (45 of 750) respondents did not have any confidence in them to manage the progression of COVID-19.

Supportive Policy and Protective Equipment in the Workplace

Regarding the supportive policy and measures regarding COVID-19 in the workplace, 84% (881 of 1048) respondents reported different extents of policies in their workplace. Those who reported that their company lacked any policy were mainly in the blue-collar group (23%, P<0.01) and four industrial sectors: import/export, wholesale, and retail trades (18%); manufacturing (17%); miscellaneous social and personal services (16%); and accommodation and food services (11%) (P<0.01). Those who reported having workplace policy in their company were not satisfied with the arrangement and provided negative comments on its comprehensiveness (36%, 319 of 881), timeliness (38%, 337 of 881), and transparency (63%, 558 of 881). The comprehensiveness of workplace policy was perceived as being inadequate significantly more by the associated professional group (41%) and the blue-collar groups (40%) than the other three occupational groups (P<0.01). Again, the associated professional group (44%) and the blue-collar groups (42%) also had significantly worse experience than the other three occupational groups about the timely updates on workplace policy (P<0.01). For the transparency, there was no significant among the occupational groups (Table 3).

Only 68% (715 of 1048) respondents reported that their workplace supplied face masks to them. It was found that the availability of personal protective equipment such as face masks was significantly lower among the groups of professional workers (38%), managerial workers (33%), and blue-collar workers (34%) in their workplace (P<0.05). Approximately, 14% (144 of 1048) respondents neither had personal stocks of face masks nor its supply from the workplace.

Personal Hygiene Practice

For the precautions undertaken to prevent the COVID-19, 74% (774 of 1048) respondents reported that they always washed their hands before meals and 95% (998 of 1048) washed hands after toileting. Majority of them (94%, 980 of 1048) wore face masks outdoors, but only 56% (584 of 1048) of them applied alcohol swabs. Regarding social distancing, half of them (51%, 539 of 1048) claimed that they always avoided going outside their homes and 59 % (618) avoided contact with their neighbours. There was no significant difference among the different occupational groups.

Concerns and Suggestions Regarding Workplace Safety

Two top concerns identified by majority of employees were 'updates on epidemic of COVID-19' (82%, 864 of 1048) and 'adequate supply and stock of face masks in workplace' (77%, 810 of 1048). We found no significant difference among different occupational groups. According to the free-text comments (Table 4), there were 168 suggestions to enhance workplace safety at two levels: government policy (macro-level) and workplace policy and guideline (micro-

level). For the macro-level, the top five suggestions were (1) full border closure (52%, 14 of 27), (2) compulsory home office for all occupations (11%, 3 of 27), (3) policy for penalizing those with hiding travel history due to the quarantine policy, quarantine, mass stock and inflation in the cost of face masks (11%, 3 of 27), (4) disseminating truth and timely information (7%, 2 of 27), and (5) providing financial subsidy for enterprises (7%, 2 of 27). Additionally, (1) promotion of stress management (51%, 72 of 141), (2) home office with technological support (16%, 23 of 141), (3) policy to reduce social distancing (14%, 20 of 141), (4) providing guideline for wearing protective measures and supply of protective measures (9%, 12 of 141), and (5) reduced workload and rescheduling timeliness of deliverables (4%, 6 of 141) were the top five suggestions for the micro-level of workplace setting.

Relationship of Overall Stress and Workplace Stress with Workplace Policy

The increase in the overall self-report stress was significantly associated with the lack of workplace policy in place [OR 1.54, 95% CI 1.03 – 2.31], inadequate comprehensiveness [OR 1.96, 95% CI 1.49 – 2.58], lack of timeliness [OR 1.64, 95% CI 1.25 – 2.14], and lack of protective equipment supply [OR 1.28, 95% CI 0.99 – 1.65] (Table 5). Same risk factors were identified to be significantly associated with self-perceived risk of own infection of COVID-19 and self-perceived risk of family infection of COVID-19 due to work (Table 5).

Discussion

Based on our knowledge, this is the first study to explore the views on workplace stress and safety in employees during the COVID-19 epidemic. The study revealed that almost all working people were stressful in the workplace and worried about being infected and family being infected by COVID-19 in their workplace and workplace policy in place and its comprehensives and timeliness were found to be driving factors. The findings further suggest that government's overarching policy regarding workplaces, accessibility to organization's workplace policy, comprehensive coverage of workplace policy, and provision of protective measure such as face masks are key consequences of heightened stress related to being infected with COVID-19 in the workplace. Besides operational policy and guidelines, majority of respondents repeatedly highlighted the need for promotion of stress management in workplace during the COVID-19 pandemic.

In our survey, the respondents consistently emphasized on the importance of government policy as a key and overarching role to drive occupational safety in business including full border closure, compulsory home office, and collaborating with business sectors to formulate operational guidelines for social distancing. Singapore has been discussing the implementation and intensification of social distancing measures, including staff working at staggered hours and setting up telecommuting office to deal with the possible COVID-19 outbreak.[17] A considerable amount of time is need for implementing social distancing measure that would restructure the organization culture and the local context of the society as the situation evolves. Without the government's top-down policy, socially irresponsible behaviours may pose a risk to all. The COVID-19 spread likes a wave to different countries progressively; resumption of office duty and social activity may create a threat for another wave of COVID-19 globally. COVID-19 is an insidious infectious disease that may bring more serious outcomes with genetic evolution before vaccination and treatment are initiated. Therefore, workplace safety involving businesses and employers in the society is the key to long-term success in the battle of the COVID-19 pandemic.

Regarding the micro-level workplace policy at the organization, majority of respondents perceived information not being openly disclosed or lack of transparency involving any staff member with a suspected, confirmed, or close-contact cases. This information is important to alert staff to adjust their social activity accordingly and immediately implement arrangements for the workplace in terms of changes in the office layout. Respondents were worried about any non-paid leave or salary penalties for absence due to sickness or compulsory being quarantined for flu or COVID-19. About one-third of respondents commented on the comprehensiveness of guideline. In the textual comments, they suggested the need for instruction on personal hygiene, wearing face masks (when, who, and how), and staff who develop flu-like symptoms to stay at home and contact health services. About one-third of respondents commented that the guideline should be updated in a timely manner as the situation evolves and highlighted the importance of providing protective resources including face masks and hand soaps when these products are unavailable in the market. Those working manually (blue-collar group) reported poor experience of having workplace policy and guidelines. It is important to strengthen the communication through mobile or other technology to disseminate the timely and update information as well as create interactive platforms for alleviating any ambiguities. In addition, the infrastructure of technology must be used to facilitate special work arrangements during epidemics. Timely updates on morbidity and mortality rates related to COVID-19 by the media; stress management techniques such as relaxation exercise, breathing, and music; and workplace layout were suggested by respondents to motivate and keep them focused on their job in an isolated and tense situation during the crisis of COVID-19 outbreak.

Despite the increase in local and global efforts to improve the infection control and prevention and awareness of personal hygiene, our findings highlight that only two-third of respondents washed hands before meals or after toileting. It is suggested that hand hygiene is more important than wearing face mask for healthy people not working in health-care setting.[12] As indicated by previous surveys of infectious diseases during epidemics, infection control training is important to increase awareness and improve the personal hygiene performance.[17–21]

Our study has two main limitations. First, our results are based on a non-probabilistic sampling strategy. Therefore, the occupational structure was different as compared to the local working population in Hong Kong. Thus, adjusted weighting of the occupation groups was applied based on the distribution of labour force in HK[16] . In addition, we did not recruit those aged 15–17 years due to complexity of consent seeking. Therefore, the voice of this group is not included in the survey. Our study highlighted that those working in blue-collar occupations were more worried and had worse experience of accessibility to workplace policy than did other occupational groups. The distribution of respondents in 11 industrial fields were also not proportional to the distribution in HK working population with less in ‘retail, accommodation and food services’ and ‘financing, insurance, real estate, professional and business service’ but more in ‘pubic administration, social work activities and personal service’.[17] Thus, the second limitation involving overall self-reported stress and views towards workplace policies and protective practices are possibly underestimated in our study shows. Despite these limitations, our study provides important insight into existing shortcomings in workplace policy at macro- and micro-levels among the employee for international reference so as to mitigate the possible outbreak of COVID-19 at workplaces.

Conclusion

During the pandemic of COVID-19, workplace guidelines in non-health-care settings are equally important as those in health-care settings due to the large proportion of labour force, which may increase the risk of spread the disease in the community. This study highlighted deficiencies in the crucial aspects of guidelines for preventing the epidemic at workplace such as government's overarching policy in terms of the macro environment involving the closing of borders, home office arrangements, and financial support for businesses; thus, timely and transparent organizational policies with operational instructions regarding protective measures and training in infection control are not evident. Effort by government should also aim to ensure the availability of protective resources in workplaces to alleviate workplace stress. This study further hinted at the importance of mental health during the pandemic to prevent post-traumatic stress.

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Authors' Contributors

Wong ELY is the lead author and all authors designed the study and generated hypothesis. Wong ELY, Ho KF and Cheung AWL analysed the data. Wong ELY prepared the manuscript and all authors provided substantial comments on the paper and approved the final version.

Declaration of interests

All authors are employees of The Chinese University of Hong Kong and declare no competing interests.

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Ethics Approval

The study was reviewed and approved by the Survey & Behavioural Research Ethics Committee of The Chinese University of Hong Kong.

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Table 1 Characteristics of the participants

	Study sample (n = 1·048), n (%)	HK Population[1] (%)
Age Group[2]		
18-29[+]	217 (20.7)	18.6
30-39	294 (28.1)	25.0
40-49	345 (32.9)	23.6
50-59	163 (15.6)	22.7
≥60	28 (2.8)	10.1
Gender		
Female	712 (67.9)	50.5
Male	336 (32.1)	49.5
Education Level		
Lower Secondary or below	10 (1.0)	
Upper Secondary	103 (9.8)	
Form 6 to Form 7	148 (14.1)	
University or above	787 (75.1)	
Marital Status		
Single	444 (42.4)	
Married/ Cohabited	557 (53.1)	
Divorced/ Widowed	47 (4.5)	
Living Status		
Alone	68 (6.5)	
Lived with Family/ Others	980 (93.5)	
Employment Status		
Full-time	950 (90.7)	
Part-time	98 (9.4)	
Occupation Group		
Managers and administrators	183 (17.5)	11.6
Professionals	440 (43.0)	7.9
Associate professionals	256 (24.4)	20.6
Clerical support workers	104 (10.9)	12.8
Service and sales workers	53 (5.1)	16.0
Craft and related workers	2 (0.2)	6.3
Plant and machine operators and assemblers	0 (0.0)	4.4
Elementary occupations	3 (0.3)	20.2
Others[3]	7 (0.7)	0.1
Industrial Field		
Manufacturing	35 (3·34)	2.7
Construction	105 (10·02)	9.1
Import/export and wholesale	100 (9·54)	11.5
Retail, accommodation and food services	28 (2·67)	16.3
Transportation, storage, postal and courier services, Information and communications	100 (9·54)	11.7
Financing, insurance, real estate, professional and business services	116 (11·07)	20.5
Public administration, social work activities and personal services	526 (53·63)	27.7
Others[4]	2 (0·19)	0.6
Self-report Having Chronic Illness		
Yes	151 (14·41)	
No	897 (85·59)	

1.Hong Kong Annual Digest of Statistics 2019. Census and Statistics Department, HKSAR, 2019.
&Data refer to overall labour force statistics
2 Data for HK Census and Statistics Department refers to population ≥15 years and for study sample ≥18 years
3 Others: Farm workers, Animal husbandry workers and Fishermen, Occupations unidentifiable or inadequately described
4 Others: Agriculture; forestry and fishing; Mining and quarrying; Electricity and gas supply; Water supply; sewerage, waste management and remediation activities and industrial activities unidentifiable or inadequately described.
The total was not equivalent to 100% due to round-up estimation

Table 2 Workplace stress by occupation groups

	Managers and administrator [N=122] N (%)	Professionals [N=82] N (%)	Associate professionals [N=216] N (%)	Service/ shop sales workers [N=134] N (%)	Blue-collar workers[1] [N=493] N (%)	Total [N=1048] N (%)	P-value[2]
Overall stress level							0.279
Not worried at all	17 (13.7)	6 (7.7)	19 (9.0)	22 (16.4)	61 (12.3)	125 (11.9)	
A bit worried	40 (32.8)	28 (33.6)	68 (31.3)	39 (28.9)	137 (27.7)	311 (29.6)	
Moderate worried	25 (22.8)	19 (23.6)	44 (20.3)	34 (25.0)	114 (23.1)	236 (22.5)	
Very worried	24 (19.7)	21 (25.0)	60 (27.7)	31 (23.1)	144 (29.2)	280 (26.7)	
Extremely worried	16 (13.1)	8 (10.0)	25 (11.7)	9 (6.7)	38 (7.7)	97 (9.2)	
Worried being infected from COVID-19 due to work							0.028
Not worried at all	17 (13.7)	10 (11.6)	15 (7.0)	12 (8.7)	15 (3.1)	68 (6.5)	
A bit worried	47 (38.8)	27 (33.2)	73 (33.6)	50 (37.5)	175 (35.4)	372 (35.5)	
Moderate worried	37 (30.1)	22 (26.4)	57 (26.2)	44 (32.7)	175 (35.4)	333 (31.8)	
Very worried	11 (9.3)	16 (19.3)	43 (19.9)	16 (11.5)	91 (18.5)	177 (16.9)	
Extremely worried	10 (8.2)	8 (9.6)	29 (13.3)	13 (9.6)	38 (7.7)	97 (9.3)	
Worried family being infected from COVID-19 due to work							0.012
Not worried at all	15 (12.0)	10 (12.1)	19 (8.6)	10 (7.7)	15 (3.1)	69 (6.6)	
A bit worried	51 (42.1)	25 (30.9)	67 (30.9)	56 (41.4)	167 (33.9)	366 (34.9)	
Moderate worried	30 (24.6)	17 (20.9)	46 (21.5)	30 (22.1)	137 (27.7)	260 (24.8)	
Very worried	13 (10.4)	17 (20.2)	38 (17.6)	22 (16.4)	99 (20.0)	188 (17.9)	
Extremely worried	13 (10.9)	13 (15.9)	46 (21.5)	17 (13.5)	76 (15.3)	166 (15.8)	

1 Blue-collar workers included those were service workers, sales, craft works, plat/ machine operators and assemblers, and elementary workers

2 Chi-square test were performed

The total was not equivalent to 100% due to round-up estimation

Table 3 Views towards workplace policy by occupation groups

	Managers and administrator N (%)	Professionals N (%)	Associate professionals N (%)	Service/ shop sales workers N (%)	Blue-collar workers[1] N (%)	Total N (%)	P-value[2]
Having policy	**[N=121]**	**[N=82]**	**[N=216]**	**[N=134]**	**[N=493]**	**[N=1048]**	0.003
Yes	107 (88.0)	75 (91.4)	200 (92.6)	119 (88.5)	379 (76.9)	881 (84.1)	
No	15 (12.0)	7 (8.6)	16 (7.4)	16 (11.5)	114 (23.1)	167 (15.9)	
	[N=107]	**[N=75]**	**[N=200]**	**[N=119]**	**[N=379]**	**[N=880])**	
Comprehensiveness							0.003
Negative	25 (23.6)	23 (30.6)	83 (41.4)	36 (30.4)	152 (40.0)	319 (36.2)	
Positive	82 (76.4)	52 (69.4)	117 (58.7)	83 (69.6)	228 (60.0)	562 (63.8)	
Timeliness							0.001
Negative	27 (25.5)	23 (31.1)	89 (44.3)	39 (32.6)	159 (42.0)	337 (38.3)	
Positive	80 (74.4)	52 (68.9)	111 (55.7)	80 (67.4)	220 (58.0)	543 (61.7)	
Transparency							0·355
Negative	62 (57.8)	47 (62.7)	135 (67.5)	79 (66.3)	235 (62.0)	558 (63.4)	
Positive	45 (42.2)	28 (37.3)	65 (32.5)	40 (33.7)	144 (38.0)	323 (36.6)	
	[N=121]	**[N=82]**	**[N=216]**	**[N=134]**	**[N=493]**	**[N=1048]**	
Supply of Protective Equipment (Face mask)							0.011
Yes	82 (67.2)	51 (61.4)	160 (74.2)	96 (71.2)	326 (66.2)	715 (68.2)	
No	40 (32.8)	32 (38.6)	56 (25.8)	39 (28.9)	167 (33.9)	333 (31.8)	

1 Blue-collar workers included those were service workers, sales, craft works, plat/ machine operators and assemblers, and elementary workers
2 Chi-square test were performed
The total was not equivalent to 100% due to round-up estimation

Table 4 Suggestion to strengthen workplace policy

Level	Suggestion	N (%)
Macro Level: Government Policy	Full border closure	14 (51.9%)
	Compulsory home office for all occupations	3 (11.1%)
	Penalty policy for hiding travel history, lack of quarantine compliance, avoiding accumulation of face masks, price inflation of face mask	3 (11.1%)
	Disseminate truth and timely information about COVID-19	2 (7.4%)
	Provide financial subsidy to unemployed, self-employed and small-medium scale of enterprises within 1 month	2 (7.4%)
	Provide subsidy to buy face masks and disinfectant products	1 (3.7%)
	Delay tax payment for self-employed and small-medium scale of enterprises	1 (3.7%)
	Guideline for protective equipment (when, what and how)	1 (3.7%)
		27 (100.0)^
Micro Level: Organization Policy	Promotion of stress management in workplace e.g. relaxation exercise, breathing, music, workplace design, coping with “epidemic flu news”,etc	72 (51.1%)
	Home office with technology support	23 (16.3%)
	Policy to reduce social distancing, e.g. reduce meeting, workplace layout re-design, flexible working hour and lunch hour, roster system or shift office work, reduce working hour, reduce or forbidden outsider to access to office, no-pay leave on voluntary basis	20 (14.2%)
	Provide guideline for wearing face mask (who, when and how) and provide protective measure, e.g. two face masks daily, hand soap, tissue, alcohol spray	12 (8.5%)
	Reduce the workload or postpone timeline of task deliverable	6 (4.3%)
	Provide timely information and knowledge of coronavirus	3 (2.1%)
	Provide guideline for sick employee (avoid working at office) and quarantine case without penalty on salary or leave	2 (1.4%)
	Disinfecting office and toilet daily	2 (1.4%)
	Participate community service, e.g. face mask production	1 (0.7%)
		141 (100.0)

The total was not equivalent to 100% due to round-up estimation

Table 5 Factors associated with overall stress and worry of infection from COVDI-19 in workplace

Overall stress level[1]	**OR [95% CI]**[2]	**P-value**
Model 1: Accessibility to workplace policy (No)	1.54 [1.03; 2.31]	0.035
Model 2: Comprehensiveness of workplace policy (Not enough)	1.96 [1.49; 2.58]	<0.001
Model 3: Timely update on workplace policy (No update/ too late)	1.64 [1.25; 2.14]	<0.001
Model 4: Transparency of workplace policy (No/ not sure)	0.98 [0.75; 1.28]	0.876
Model 5: Workplace supply of protective equipment - mask (Not provided)	1.28 [0.99; 1.65]	0.055
Worries being infected due to work[1]		
Model 1: Accessibility to workplace policy (No)	1.76 [1.16; 2.67]	0.008
Model 2: Comprehensiveness of workplace policy (Not enough)	3.26 [2.43; 4.38]	<0.001
Model 3: Timely update on workplace policy (No update/ too late)	3.16 [2.36; 4.22]	<0.001
Model 4: Transparency of workplace policy (No/ not sure)	1.16 [0.88; 1.53]	0.291
Model 5: Workplace supply of protective equipment - mask (Not provided)	0.85 [0.66; 1.11]	0.240
Worries family being infected due to work[1]		
Model 1: Accessibility to workplace policy (No)	1.56 [1.04; 2.34]	0.033
Model 2: Comprehensiveness of workplace policy (Not enough)	2.87 [2.16; 3.80]	<0.001
Model 3: Timely update on workplace policy (No update/ too late)	2.70 [2.05; 3.57]	<0.001
Model 4: Transparency of workplace policy (No/ not sure)	1.21 [0.92; 1.58]	0.165
Model 5: Workplace supply of protective equipment - mask (Not provided)	0.90 [0.70; 1.16]	0.432

Noted CI, confident interval

1 The responses of the questions of the "overall stress level", "worries being infected of COVID-19 due to work", and "worries family being infected of COVID-19 due to work" were regrouped into three level status (not at all, a bit/ moderate, very/ extremely).

2 All ordinal logistics models were adjusted by age, sex and occupation