

Prevalence and correlates of psychological distress and coronavirus anxiety among hospital essential services workers in Singapore

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ABSTRACT

Introduction: The COVID-19 pandemic has affected almost all populations, with frontline workers experiencing a higher risk of mental health effects compared to other groups. Although there are several research studies focusing on the mental health effects of the pandemic on healthcare workers, there is little research about its impact on workers in outsourced hospital essential services. This study aims to examine the prevalence and correlates of psychological distress and coronavirus anxiety among staff working in 3 outsourced hospital essential services—housekeeping, porter service and maintenance services.

Methods: A cross-sectional study was conducted among outsourced hospital essential services workers in a tertiary hospital. Data on demographics, medical history, lifestyle factors, psychosocial factors and mental well-being were collected using self-administered questionnaires. Robust logistic regression was used to determine risk factors associated with psychological distress and dysfunctional anxiety related to COVID-19.

Results: A total of 246 hospital essential services workers participated in the study. The prevalence of psychological distress was 24.7%, and dysfunctional anxiety related to COVID-19 was 13.4%. Social support and workplace support were found to be independently associated with a lower risk of psychological distress, and social connectivity was associated with a lower risk of dysfunctional anxiety related to COVID-19.

Conclusion: These findings highlight the crucial roles of communities and workplaces in combating the mental health consequences of the pandemic. Public health programmes that aim to tackle the emerging mental health crisis in hospital essential services workers should incorporate strategies to address psychosocial factors, in addition to traditional self-care approaches.

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) has affected almost all geographies in the world since 2020. Many countries have imposed strict isolation measures to contain the spread of this disease. While the majority of the population has been working from home, essential workers continue manning the frontlines, facing risks such as infection and fatigue. Such work conferred a higher chance of mental stress than the rest of the population, leading to the increased likelihood of psychological distress among essential workers. In a recent systematic review,¹ stress, insomnia, depression

and anxiety symptoms were increased among essential workers during the COVID-19 pandemic. In a study conducted in a tertiary hospital in Singapore, the prevalence of anxiety among non-medical healthcare workers was found to be higher than medical healthcare workers.² In spite of non-medical healthcare workers having a higher risk of poor mental health, little research has been done among this population, especially among workers in outsourced essential services sectors such as housekeeping, porter and maintenance services. These workers are subjected to employment and training policies different from those who are directly employed

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CLINICAL IMPACT

What is New

- To the best of our knowledge, this is one of the first few studies to investigate the mental well-being of hospital essential services workers (housekeepers, porters and maintenance staff) during the COVID-19 pandemic in Singapore.

Clinical Implications

- The findings of this study suggest that intervention strategies to improve the mental well-being of essential services workers should address psychosocial factors (social support, workplace support and social connectivity), in addition to traditional protective factors (exercise, sleep and diet).

by hospitals. In Singapore public hospitals, workers in these sectors are mostly migrant or older workers who are more vulnerable to the physical and mental health impact of COVID-19. Migrant workers are more prone to psychological stress due to lower socio-economic status, language barriers and cultural differences.³ In addition, migrant workers of Singapore who reside in purpose-built dormitories were not allowed to be in the community due to the movement restriction order imposed on them since April 2020. This restriction was only eased recently in 2022. Hence, these workers were more susceptible to the impact of COVID-19 pandemic due to prolonged confinement to their dormitories compared to the general Singapore population who were not imposed such strict level of restriction. Frontline older workers have a higher risk of anxiety and stress as they have increased risk of vulnerability to severe COVID-19 symptoms should they become infected. Hence, it is pertinent to assess the mental well-being of this understudied population during the pandemic. In this study, we examine the prevalence and risk factors of these essential workers' mental well-being, to help in effective public health intervention strategies.

METHODS

Study design and study population

This cross-sectional study was conducted among workers in 3 outsourced hospital essential services—housekeeping, porter, and maintenance services—in a tertiary hospital from 15 September to 30 October 2020. A total of 246 essential services workers participated in the study and the overall response rate was 42.4%

(30.3% for housekeeping service, 34.4% for maintenance service and 72.3% for porter service).

Survey instrument and data collection

Data were collected using self-administered questionnaires with the option of completing it online or on paper version. The questionnaire was available in 7 languages: English, Chinese, Malay, Hindi, Tamil, Bengali and Burmese. Participants could select the languages of questionnaires according to their personal preferences.

Mental well-being was assessed by the Kessler-6 Distress Scale (K-6) and Coronavirus Anxiety Scale (CAS). The K-6 was developed to detect general psychological distress, and has demonstrated good reliability and validity.⁴ There are 5 response options for each question, ranging from “none of the time” to “all of the time” and a score of 0 to 4 was assigned to each response, respectively. A total score was calculated by summing up the responses to each question. Psychological distress was defined as K-6 score of ≥ 5 .⁴

The CAS is a brief mental health screener developed to identify probable cases of dysfunctional anxiety associated with the COVID-19 crisis. It has been validated for use in clinical research and practice.⁵ There are 5 items asking participants how often they experienced the listed symptoms with the 5 response options ranging from “none of the time” to “nearly every day over the last 2 weeks”. Responses for 5 questions were summed up to obtain the total score. A score of >9 was considered high anxiety.

Proximity to COVID-19 was assessed by the question “Have you experienced the following?” with “yes” and “no” options for 10 items. We categorised the proximity into 3 levels: Level 0 was no proximity; Level 1 was having friends, co-workers, co-habitants and family members being diagnosed with COVID-19 infection; and Level 2 was having been assigned to work in COVID-19 isolation facilities/wards or having been in any contact or close proximity with COVID-19 patients, having been quarantined or hospitalised, or being suspected or diagnosed of having COVID-19 infection.

We also measured psychosocial factors—perceived social support, workplace support, resilience, and social connectivity. Psychosocial factors are characteristics or facets that influence an individual psychologically and/or socially.⁶

Perceived social support was measured by the Multidimensional Scale of Perceived Social Support

(MSPSS)⁷ and resilience was measured by the Brief Resilience Scale (BRS).⁸

Workplace support was assessed by asking the participants to rate the support they received from their peers/supervisors/employers and the logistical support they received from their organisation, with scores ranging from 0 to 9.

Social connectivity (talking to families or friends in person/online/on the phone), lifestyle factors (sufficient sleep, nutritious diet, exercise, smoking and alcohol intake), and spiritual activities (praying) were assessed by asking participants how often they did these activities in the past week, with 5 options ranging from “none of the time” to “all of the time” and scores assigned from 1 to 5, respectively. For smoking and alcohol intake, the responses were coded reversely. The lifestyle index was calculated by combining the scores from the 5 items, and a higher score indicated a healthier lifestyle. Monthly income comprised basic salary and overtime pay. In 2020, the median household income in Singapore was SGD9,189, median gross monthly income from work was SGD4,534 and the 20th percentile of gross monthly income was SGD2,300.⁹ Workers earning less than SGD1,400 per month are considered lower-wage workers.¹⁰ Perceived health status was assessed by asking participants to rate their health as poor, fair, good, very good or excellent.

Ethics approval was obtained from the SingHealth institutional review board (CIRB Ref: 2020/2757). Informed consent was obtained from each participant before the study was conducted.

Statistical analysis

In Table 1, means and standard deviations were presented for normally distributed variables, while medians and interquartile ranges were presented for skewed variables. Robust logistic regression was used to assess the association between risk factors and psychological distress/coronavirus anxiety. For multivariable analysis, we developed two-stage regression models. The first model included socio-demographic and lifestyle factors and the second model included the variables in model 1 plus psychosocial factors (social connectivity, social support, workplace support, and resilience) that were significant in the univariate analysis. There was no significant difference between participants using the online versus paper versions, thus we combined them for the analysis. All statistical tests were two-sided with a level of significance defined as a *P* value <0.05. All statistical analyses were performed using Stata 15 for Windows (Stata Corp, College Station, US).

RESULTS

Characteristics of the study population

A total of 246 outsourced essential services workers participated in this study. The majority of the participants were housekeeping staff (44.3%), with a total monthly income of <SGD1,400 (58.5%). The average age of study participants was 45.2 years. There was an approximately equal proportion of locals (Singapore citizens and permanent residents) (48.0 %) vs non-locals (50.8%), and males (52.4%) vs females (47.6%). Only 24.4% had Level 2 proximity to the COVID-19 infection. Most participants (92.3%) indicated that their health was good to excellent (Table 1).

Factors associated with psychological distress

The prevalence of psychological distress (K-6 score ≥ 5) among this study population was 24.7%. Factors associated with a higher risk of psychological distress included higher proximity to COVID-19, younger age, being from a minority ethnic group, being single, having higher income, and completing the questionnaire in English. Factors associated with a lower risk of psychological distress included having a healthy lifestyle, higher resilience, and higher social and workplace support (Table 2 Univariate). Spearman correlation of the individual component of lifestyle index showed that sufficient sleep, eating nutritiously, and exercise were negatively correlated with psychological distress. No significant correlation was detected for smoking and alcohol intake (data not shown).

A healthy lifestyle was associated with a lower risk of psychological distress (odds ratio [OR] 0.75, 95% confidence interval [CI] 0.60–0.94) even after adjusting for proximity to COVID-19, age, ethnicity, marital status, health status and language. Language was also still significantly associated with psychological distress (OR 0.15, 95% CI 0.03–0.74) (Model 1, Table 2).

After including all significant factors in the univariate model, social support (OR 0.95, CI 0.91–0.99) and workplace support (OR 0.90, CI:0.82–0.99) emerged as independent factors associated with a lower risk of psychological distress (Model 2, Table 2).

Factors associated with the coronavirus anxiety

The prevalence of CAS was 13.4% among our study population. There was a higher prevalence of anxiety among participants with higher proximity to COVID-19, younger age, minority ethnic groups, non-locals, living in dormitories or private housing, and lower prevalence among participants with a healthy lifestyle, higher workplace support, and higher social connectivity

Table 1. Characteristics of the study population

Characteristics	N=246
Age, (mean±SD), years	45.2±15.6
Sex, no. (%)	
Male	129 (52.4)
Female	117 (47.6)
Missing	0 (0)
Ethnicity, no. (%)	
Chinese	74 (30.3)
Malay	61 (25.0)
Indian	68 (27.6)
Others ^a	41 (16.7)
Missing	2 (0.8)
Marital status, no. (%)	
Never married	80 (32.5)
Currently married	140 (56.9)
Separated but not divorced/divorced/widowed	25 (10.2)
Missing	1 (0.4)
Resident status, no. (%)	
Locals ^b	118 (45.0)
Non-locals	125 (50.8)
Missing	3 (1.2)
Job category, no. (%)	
Housekeeping	109 (44.3)
Maintenance	31 (12.6)
Porter	94 (38.2)
Others ^c	11 (4.5)
Missing	1 (0.4)
Monthly income, no. (%)	
≤SGD1,400	144 (58.5)
SGD1,401–2,300	32 (13.0)
>SGD2,300	57 (23.2)
Missing	13 (5.3)
Year of experiences in current position (median, IQR)	2 (1.5)
Language, no. (%)	
English	144 (58.5)
Other languages	102 (41.5)
Missing	0 (0)
Have religion, no. (%)	202 (83.1)

Table 1. Characteristics of the study population (Cont'd)

Characteristics	N=246
Accommodation now, no. (%)	
Dormitory	11 (4.5)
Public housing	133 (54.1)
Private housing	59 (24.0)
Hotel	12 (4.9)
Missing	31 (12.6)
Perceived health status, no. (%)	
Poor/Fair	18 (7.3)
Good/very good/excellent	227 (92.3)
Missing	1 (0.4)
Have chronic disease, no. (%)	36 (14.7)
Proximity to the COVID-19 infection, no. (%)	
Level 0	166 (67.5)
Level 1	14 (5.7)
Level 2	60 (24.4)
Missing	6 (2.4)

IQR: interquartile range; SD: standard deviation

^a Bengali, Myanmar, Vietnamese, others^b Singapore citizens and permanent residents^c Executives, supervisors

(Table 3 univariate data). Spearman correlation of the individual component of lifestyle index showed that sufficient sleep and eating nutritiously were negatively correlated with CAS. No significant correlation was detected for exercise, smoking and alcohol intake (data not shown).

The association between lifestyle index and CAS was not significant after adjusting for socio-demographic factors, although the odds ratio did not change much (OR 0.88, 95% CI 0.74–1.04) (Model 1, Table 3).

Social connectivity was significantly associated with CAS even after adjusting for social demographic, lifestyle factors and workplace support (OR 0.39, 95% CI 0.19–0.77) (Model 2, Table 3).

DISCUSSION

In this study, we found that higher social support and workplace support were associated with a lower risk of psychological distress, while higher social connectivity was associated with a lower level of coronavirus anxiety.

The prevalence of psychological distress and coronavirus anxiety in this study population was lower than that of healthcare trainees in China and nurses in the Philippines.^{11,12} The prevalence of psychological

Table 2. Factors associated with psychological distress

	Univariate			Multivariate (Model 1)			Multivariate (Model 2)		
Factors	Odds ratio	95% CI		Odds ratio	95% CI		Odds ratio	95% CI	
Proximity to the COVID-19 infection									
Level 0	Reference			Reference			Reference		
Level 1	3.95*	1.23	12.69	2.18	0.39	12.10	3.62	0.32	40.78
Level 2	3.02**	1.52	6.01	1.85	0.47	7.32	1.80	0.43	7.59
Age	0.96***	0.94	0.98	0.96	0.90	1.01	0.97	0.91	1.03
Ethnicity									
Chinese	Reference			Reference			Reference		
Malay	1.90	0.78	4.64	2.02	0.42	9.74	3.21	0.57	18.03
Indian	1.43	0.57	3.59	0.28	0.06	1.28	0.60	0.09	3.90
Others ^a	5.70***	2.20	14.78	1.18	0.24	5.85	1.39	0.22	8.88
Marital status									
Never married	Reference			Reference			Reference		
Currently married	0.27***	0.14	0.53	0.53	0.14	1.91	0.47	0.10	2.13
Separated/Divorced/Widowed	0.30*	0.09	0.97	2.16	0.22	21.30	6.70	0.32	139.46
Monthly income									
≤SGD1,400	Reference			Reference			Reference		
SGD1,401–2,300	2.06	0.83	5.12	1.71	0.30	9.82	3.41	0.64	18.13
>SGD2,300	3.26**	1.59	6.71	0.86	0.18	3.97	1.57	0.32	7.76
Language									
English	Reference			Reference			Reference		
Other languages	0.18***	0.08	0.40	0.15*	0.03	0.74	0.12	0.01	1.01
Perceived health status									
Fair–poor	Reference			Reference			Reference		
Good–excellent	0.39	0.14	1.10	0.19	0.02	1.61	0.61	0.04	10.13
Lifestyle index	0.76***	0.66	0.87	0.75*	0.60	0.94	0.84	0.65	1.09
Social connectivity	0.73	0.53	1.02				0.81	0.41	1.58
Resilience	0.82**	0.72	0.94				0.91	0.78	1.06
Social support	0.98*	0.96	1.00				0.95*	0.91	0.99
Workplace support	0.95**	0.91	0.98				0.90*	0.82	0.99

CI: confidence interval

^a Bengali, Myanmar, Vietnamese, others* *P* value <0.05, ** *P* value <0.01, *** *P* value <0.0001

Values in bold are significant

distress was 30.9% of moderate to severe distress (K6 score ≥ 5) among healthcare trainees in China,¹² and the prevalence of coronavirus anxiety among Filipino nurses was 37.8%.¹¹ The lower prevalence in our study population may be due to the timing of the study, which was conducted at a time when daily cases

were declining. In longitudinal studies conducted in China and the US, the prevalence of poor mental health was decreased in the follow-up studies.^{13,14} It is also important to highlight that half of our study population were migrants, who tend to have a high level of resilience.¹⁵ Although we did not find significant

Table 3. Factors associated with coronavirus anxiety

Factors	Univariate		Multivariate (Model 1)		Multivariate (Model 2)			
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI		
Proximity to the COVID-19 infection								
Level 0	Reference		Reference		Reference			
Level 1	2.03	0.40	10.32	0.05	20.54	0.81	0.02	30.01
Level 2	2.67	1.16	6.18	0.40	5.24	1.63	0.42	6.36
Age	0.96*	0.93	0.99	0.92	1.03	0.97	0.91	1.05
Ethnicity								
Chinese	Reference		Reference		Reference			
Malay	0.69	0.21	2.23	0.14	6.68	1.01	0.13	7.81
Indian	0.81	0.26	2.49	0.41	1.76	0.55	0.12	2.54
Others ^a	2.97*	1.04	8.46	0.22	7.20	1.77	0.23	13.54
Resident status								
Locals ^b	Reference		Reference		Reference			
Non-locals	3.74**	1.52	9.21	0.10	5.69	0.79	0.09	7.27
Accommodation now								
Dormitory	Reference		Reference		Reference			
Public housing	0.20*	0.04	0.88	0.05	5.77	0.33	0.02	6.52
Private housing	0.76	0.17	3.33	0.16	6.75	1.05	0.12	9.15
Hotel	2.22	0.37	13.18	0.36	37.91	3.24	0.25	42.83
Lifestyle index	0.85*	0.74	0.97	0.88	1.04	1.11	0.86	1.44
Social connectivity	0.60**	0.43	0.84	0.74	1.04	0.39**	0.19	0.77
Workplace support	0.95*	0.91	0.99	0.97	0.97	0.90	0.90	1.05

CI: confidence interval

^a Bengali, Myanmar, Vietnamese, others^b Singapore citizens and permanent residents* P value <0.05, ** P value <0.01

Values in bold are significant

association between resilience and psychological distress after adjusting for other psychosocial factors, it may be that our questionnaire was not able to fully capture all aspects of resilience, which is a multidimensional construct.¹⁶ Participants who used the English language version of the questionnaire were also found to be marginally associated with higher psychological distress than those who used other languages of the same questionnaire. This observation could be attributed to participants who chose the English language version of the questionnaire had better English language proficiency than others, and English language proficiency had been reported as a proxy for education level.^{17,18} Studies have reported that higher level of education is associated with a higher level of stress.^{19,20} Among our study participants, those who used the English language version of the questionnaire may be individuals who need to work in the middle layer between workers on the ground and upper level of management, or may have to bear higher responsibilities than those with lower level of English language proficiency. As such, participants with better English proficiency may experience more stress than others, especially during this pandemic when rapid changes in procedures and policies have to be communicated effectively to all stakeholders involved and implemented promptly.

A healthy lifestyle (exercise, eating nutritiously and sufficient sleep) was also associated with lower psychological distress after adjusting for socio-demographic factors. The benefits of exercise, balanced nutrition, and good sleep for mental well-being have been well-established.²¹⁻²³ Studies conducted during the COVID-19 pandemic also consistently reported beneficial effects of exercise, diet and sleep on mental well-being.^{21,22} However, previous studies did not account for psychosocial factors such as social and workplace support and social connectivity. In this study, the association between lifestyle factors and psychological distress was no longer significant after adjusting for psychosocial factors. Social support and workplace support were associated with a lower risk of psychological distress and social connectivity was associated with a lower risk of anxiety, independent of socio-demographic and lifestyle factors. Our findings were consistent with the findings in other populations.^{11,24} In a study done in an acute hospital in Canada, low support from supervisors and colleagues was found to be associated with a higher risk of psychological distress.²⁴ In another study, personal resilience, social support, and organisational support

were found to reduce anxiety.¹¹ Studies also showed that social connectivity independently predicted psychological distress, depression, and anxiety symptom severity.^{25,26}

The findings from these studies and our study highlighted the important role of social support and social connectivity in mental well-being. Perceived support and social connectivity were the most significant predictors, rather than traditional protective factors such as exercise, sleep and diet. This may be due to the unique nature of this pandemic, which required strict isolation measures to combat. Limited knowledge about this novel virus may also lead to elevated fear and uncertainty in the population. Moreover, the workforce was facing rapid changes in policy and procedures daily, causing enormous job stress. Social support attenuates fear and uncertainty, and reduces the effect of physiological and psychological threats.^{27,28} Thus, when faced with fear and uncertainties, there is more need for social support and social connectivity.^{29,30} In a randomised clinical trial, it was reported that 10-minute telephone calls delivered by a trained layperson reduced loneliness, anxiety and depression among adults during the COVID-19 pandemic.³¹ Social connectivity may also improve physical health. In an experimental study, it was found that social connectivity positively predicted a change in vagal tone.³² Hence, an intervention to improve social connectivity should be considered where social isolation is imposed to control the spread of infection. In Singapore, there are some programmes to improve social connectivity in a particular population and these programmes could be adopted for other vulnerable populations. When there was a lockdown in foreign workers dormitories in Singapore, free Wi-Fi services were provided to foreign workers allowing them to stay in touch with their families in overseas.³³ Similar service could be extended to low-income communities to stay connected with their loved ones during lockdown. Another programme is a befriending service provided by a social service agency for seniors who are at risk of social isolation.³⁴ Trained befrienders provide social and psycho-emotional support through weekly home visit to seniors. During pandemic, the agency utilises technology to keep engaging seniors through digital clinics. This service could also be offered to other populations socially disconnected due to social isolation measures during the pandemic, to reduce depression and anxiety.

Despite having high hopes of returning to normal life with the availability of vaccines, we may not be able to rule out the possibility of another lockdown in the

near future, due to the occurrence of new virus variants. Even if we overcome this COVID-19 pandemic, infectious diseases experts warn that the current pandemic is unlikely to be the last. Thus, public health intervention strategies should integrate activities to improve the psychoneuroimmunity of the population. At the microlevel, healthy lifestyles and social connectivity should be encouraged and promoted. At the meso level, social support and workplace support should be increased among communities and workplaces. At the macro level, advocacy for guidelines and policies to effectively combat the emerging mental health crisis are pertinent. Employers play an important role in addressing these factors. Employers could support health promotion programmes at workplaces to encourage their employees to adopt and maintain healthy lifestyles, since those with higher organisational support tend to participate in health promotion programmes.³⁵ Workplace support should not only cover basic needs such as food on-site, groceries and childcare support; it should also create a culture that encourages open communication, and a safe and supportive working environment to improve mental well-being of employees.^{36,37}

Our study has some limitations. As this is a cross-sectional study, we cannot establish a causal relationship. Our study only included outsourced hospital essential services workers in 3 sectors as there were operational challenges of recruiting other outsourced hospital workers in other departments (e.g. security, temperature screeners, etc.) for this study. The small sample size and low response rate may limit the generalisability of the results. Nevertheless, we managed to obtain a high response rate among porters (72.3%) and thus the findings in the group may be generalisable. In addition, we used a mixed mode of survey administration (online and paper version) that is found to produce more representative results as different modes appeal to different populations.³⁸ Moreover, this is one of the first few studies conducted among outsourced essential services workers. Our study included both local and foreign workers in Singapore, and we were able to assess comprehensive risk factors, allowing us to identify independent factors at the micro and meso levels.

CONCLUSION

Psychosocial factors should be included in public health strategies to improve the mental well-being of the vulnerable population of essential services workers. More research is needed to understand the impact of this pandemic on such workers.

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