1 **Type:** Preprint (PsyArXiv) v1 (5/11/21), brief report

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3 **FULL TITLE**

4 Factors predicting anxiety and depression symptoms among migrant workers in the Greater China
5 area during the early COVID-19 pandemic: A brief report

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7 **SHORT TITLE**

8 Psychological problems among migrant workers

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16 **CONFLICT OF INTEREST**

17 The author declares no conflict of interest.

18

19 **ACKNOWLEDGMENTS**

20 The author thanks the Indonesian Migrant Workers Union for the assistance for the data collection
21 and Prof Brian J Hall for the guidance of the study. The study was completed when the author was a
22 postdoctoral fellow at the University of Macau.

23

24 **FUNDING**

25 This study received no funding from any institution.

26

Factors predicting anxiety and depression symptoms among migrant workers in the Greater China area during the early COVID-19 pandemic: A brief report

Abstract

This study briefly reported the prevalence and factors predicting anxiety and depression symptoms among migrant workers in the Greater China area. An online survey was conducted between February and March 2020 among Indonesian migrant workers in Macau, Hong Kong, and Taiwan. Data from 491 participants were analyzed using a series of hierarchical logistic regression. The prevalence rates for clinically meaningful symptoms of anxiety and depression were 31.8% and 26.9%, respectively. Factors predicting anxiety symptoms were age, marital status, income level, educational level, and Cantonese fluency. Older participants, married, have higher income and education, and are more fluent in Cantonese were less likely to experience anxiety than their counterparts. Factors predicting depression symptoms were age, marital status, English fluency, and Cantonese fluency. Older participants, married, and more fluent in English and Cantonese were less likely to experience depression than their counterparts. Stakeholders should consider these findings in public health planning to make it more inclusive for migrant workers.

Keywords: psychopathology, occupational health, clinical psychology, health psychology, global health, health equity

Factors predicting anxiety and depression symptoms among migrant workers in the Greater China area during the early COVID-19 pandemic: A brief report

BACKGROUND

Migrant workers have a greater risk of developing psychological problems during their stay in the host country, including anxiety and depression [1]. However, previous studies were mainly conducted during a normal situation where the findings might differ during the pandemic [2, 3]. Moreover, migrant workers are less likely to have adequate social protections, including health insurance and healthcare access [4]. Therefore, it is important to investigate anxiety and depression among migrant workers during the early pandemic of coronavirus disease 2019 (COVID-19) as depression is reported as the leading cause of disability worldwide [5]. This study aimed to measure the prevalence rate of self-reported anxiety and depression symptoms and identify its predictors among Indonesian migrant workers (IMWs) in the Greater China area, including Macau, Hong Kong, and Taiwan as they are close to the COVID-19 pandemic epicentrum.

METHODS

Data collection and participants

This cross-sectional study was conducted from February to March 2020. The distribution of the online questionnaire link was assisted by the Indonesian Migrant Workers Union. The Ethics Committee of the University of Macau approved this study before the survey. Participants were IMWs in Macau, Hong Kong, and Taiwan with an average age of 36 years old (Standard Deviation/*SD* = 6.3) and were predominantly female participants (92.0%). Details of the participants' characteristics were presented in Table 1.

[insert Table 1]

Measures

The basic demographics information was asked first as presented in Table 1. The language fluency consisted of two items (e.g., "How is your English reading and listening fluency?" and "How is your English writing and speaking fluency?") for three languages (English, Cantonese, and Mandarin). The responses were 4-point Likert scale from 1 (not fluent at all) to 4 (very fluent). On each item, scores 1 and 2 was categorized as "poor" and "good" for scores 3 and 4. The Cronbach's alpha of the language fluency scale was .77.

The Generalized Anxiety Disorder-7 (GAD-7) [6] was used to measure the anxiety symptoms. Seven self-report items were rated from 0 (not at all) to 3 (nearly every day). Scores on each item were summed such that the total score ranged from 0 to 21 that a total score of ≥ 10 indicated anxiety. Total score can also be categorized into four levels of severity: none (< 5), mild (5-9), moderate (10-14), and severe (> 14). The Cronbach's alpha of GAD-7 in this study was .91 comparable to the previous study among earthquake survivors in Indonesia ($\alpha = .88$) [7].

The Patient Health Questionnaire-9 (PHQ-9) [8] was used to measure depressive symptoms. This questionnaire consisted of nine items with options from 0 (not at all) to 3 (nearly every day). Scores on each item were summed (ranged from 0 to 27) that a total score of ≥ 10 indicated major

depression disorder. Total score can also be categorized into four levels of severity: none (<5), mild (5-9), moderate (10-14), and moderately severe (15-19), and severe (>19). The Cronbach's alpha of PHQ-9 in this study was .90, comparable with the previous validation study ($\alpha = .86$). [1].

Analysis

Data were descriptively analyzed first, including participants' demographic information and the proportion of participants with clinically meaningful symptoms of anxiety and depression. The analysis was followed by two hierarchical logistic regression analyses predicting anxiety symptoms from GAD-7 total score (<10 vs ≥ 10) and depression symptoms from PHQ-9 total score (<10 vs ≥ 10). Variables set as predictors were age (≤ 36 vs >36), location (Macau vs non-Macau), length of stay (<6 vs ≥ 6 years), type of job (domestic and care work vs non-domestic and care work), income (<7 vs ≥ 7 million rupiah), accommodation (live in vs non-live in), insurance ownership (no insurance vs have insurance), province of origin (Non-Java provinces vs Java provinces), educational level (lower than senior high school vs senior high school and higher), marital status (non-married vs married), sexual orientation (heterosexual vs non-heterosexual), mental disorder history (no history vs have history), English reading and listening fluency (poor vs good), English writing and speaking fluency (poor vs good), Cantonese reading and listening fluency (poor vs good), Cantonese writing and speaking fluency (poor vs good), Mandarin reading and listening fluency (poor vs good), and Mandarin writing and speaking fluency (poor vs good).

The hierarchical logistic regression analyses were built by two blocks. Age was entered in Block 1 using "Enter" method". Sex was also planned to be included in Block 1 but annulled due to the insufficient number of male participants with anxiety and depression. In Block 2 the rest of the predictors were added using "Forward LR" method. The adjusted odd ratios (ORs) with associated 95% confidence intervals (CIs) were reported. Data were analyzed with SPSS 24 and the statistical significance level (p) was set at .05 (two-sided).

RESULTS

Descriptive statistics

The average score of GAD-7 was 7.18 ($SD = 5.56$) that 31.8% of participants were screened with anxiety (total score of ≥ 10). The severity level prevalence was 30.3%, 19.6%, and 12.2% for mild, moderate, and severe, respectively. The average score of PHQ-9 was 6.46 ($SD = 5.54$) that 26.9% of participants were screened with depression (total score of ≥ 10). The severity level prevalence was 28.3%, 17.3%, 6.3%, and 3.3% for mild, moderate, moderately severe, and severe respectively. The prevalence of participants with clinically meaningful symptoms of anxiety and depression that were categorized based on the binomial demographic variables was presented in Table 2.

[insert Table 2]

Predicting anxiety and depression symptoms

Models for predicting anxiety and depression symptoms were presented in Table 3. Model 4 showed age, marital status, income, educational level, and Cantonese writing and speaking fluency were significantly associated with anxiety. Participants aged older than 36 years ($OR = 0.52$, 95% $CI = 0.33-0.82$), married ($OR = 0.40$, 95% $CI = 0.24-0.66$), have income seven million or more ($OR = 0.63$,

128 95% *CI* = 0.40-0.97), completed senior high school or higher education level (*OR* = 0.57, 95% *CI* =
129 0.37-0.88), and fluent in writing and speaking Cantonese (*OR* = 0.65, 95% *CI* = 0.42-0.99) were less
130 likely to experience anxiety than their colleagues. This model accounted for 13% of the variance in
131 anxiety symptoms among participants.

132 For depression symptoms, Model 3 showed age, marital status, English writing and speaking
133 fluency, and Cantonese reading and listening fluency were significantly associated with it.
134 Participants aged older than 36 years (*OR* = 0.46, 95% *CI* = 0.29-0.74), married (*OR* = 0.27, 95% *CI* =
135 0.15-0.48), fluent in writing and speaking English (*OR* = 0.51, 95% *CI* = 0.33-0.79), and fluent in
136 reading and listening Cantonese (*OR* = 0.59, 95% *CI* = 0.37-0.93) were less likely to experience
137 depression than their colleagues. This model accounted for 15% of the variance in depression
138 symptoms among participants.

139

140 DISCUSSION

141 This study aimed to measure the prevalence rate of self-reported anxiety and depression and
142 identify its predictors among IMWs in the Greater China area during the early COVID-19 pandemic.
143 It was found that the prevalence rates of clinically meaningful symptoms were 31.8% for anxiety and
144 26.9% for depression. These prevalence rates were higher than IMWs in South Korea [3] and Macau
145 [1] in a non-pandemic situation. Furthermore, the severity levels of anxiety and depression in the
146 current study were relatively more intense than a study among Indonesian adolescents affected by
147 the 2016 Aceh Earthquake [7]. For example, the symptoms severity level prevalence was 12.2% for
148 anxiety and 3.3% for depression in this study, compared with 5.0% and 0.9% in the earthquake study.
149 These differences might be because the current study was conducted in the early stage of the
150 pandemic while the earthquake study was a 6-month follow up. This study also found that more
151 women experienced anxiety and depression symptoms than men that was consistent with
152 Indonesian disaster survivors [9] and migrant workers globally [2].

153 The hierarchical logistic regression models showed that age and marital status were
154 consistently associated with anxiety and depression symptoms. This finding supported previous
155 results among post-tsunami survivors in Indonesia who also showed that older and married survivors
156 were less likely to experience psychological disorders than younger and non-married survivors [9]
157 and Korean migrants in the US [5]. This study also supported findings of systematic review on
158 psychological pathologies of migrant workers, including anxiety, which were more likely experienced
159 by migrant workers with low educational level and lower income than their counterparts [2]. In
160 contrast, income level and educational level were not associated with depression symptoms, which
161 was also found among Indonesian migrant workers in South Korea during normal situations [3].

162 Interestingly, this current study found that language fluency contributed to predicting migrant
163 workers' anxiety and depression symptoms early in the pandemic. In particular, migrant workers
164 with local language active skills (i.e., writing and speaking in Cantonese) were less likely to
165 experience clinically meaningful symptoms of anxiety; and they who passively fluent in the local
166 language (i.e., reading and listening in Cantonese) and actively fluent in English (i.e., writing and
167 speaking) were less likely to experience clinically meaningful symptoms of depression compared to

migrant workers with poor language fluency. These findings supported previous studies that found a language mastery was a key skill in wellbeing, help-seeking behavior, and successful acculturation process and low acculturative stress by adjusting with new values or norms in the new environment among migrants globally [10-12].

Limitations and strengths

Three limitations should be acknowledged in this study. First, there is a risk of self-selection bias from the convenience sampling method using an online survey and through the network of the migrant workers union. Second, the underrepresentation of male participants might limit the generalization of the findings. Third, as a cross-sectional study, relationships between the variables could not be interpreted as causality. However, this study has also several strengths. First, the sample size was relatively large from the area near the pandemic epicentrum. Second, the demographic information showed that participants came from a relatively diverse background (e.g., level in income and job type). Third, although the number of male participants was lower than female participants, this condition represents the fact that Indonesian migrant workers in the Greater China area are dominated by women related to domestic work as the primary type of job.

New contribution to the literature

Psychological disorders among migrant workers have been investigated but relatively little is known when the migrant workers are in a crisis like the COVID-19 pandemic. Therefore, this study contributed substantially to understanding the prevalence of anxiety and depression symptoms among migrant workers early in the crisis that could be for planning the post-crisis intervention. The stakeholders should consider findings from this study in public health planning, including during the pandemic, such as using multiple languages in any announcement since migrant workers with poor local language fluency have a higher risk to experience anxiety and depression symptoms. Moreover, the host countries might provide professional translators or interpreters in the related departments (i.e. Labor Department) and hospitals to overcome this language barrier among migrant workers.

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- 225

227 Table 1. Characteristics of participants

Variables	<i>f</i>	%
Location		
Macau	287	58.5
Hong Kong	146	29.7
Taiwan	58	11.8
Length of stay		
<7 months	32	6.5
7-11 months	30	6.1
1 year - 1 year 11 months	40	8.1
2 years - 2 years 11 months	41	8.4
3 years - 3 years 11 months	58	11.8
4 years - 4 years 11 months	35	7.1
5 years - 5 years 11 months	39	7.9
6 years - 6 years 11 months	36	7.3
7 years - 7 years 11 months	36	7.3
8 years - 8 years 11 months	21	4.3
9 years - 9 years 11 months	22	4.5
10 years - 10 years 11 months	24	4.9
11 years or more	77	15.8
Type of job		
Domestic worker (household tasks only)	113	23.0
Domestic worker (caregiving tasks only, including child / elder / pet sitting)	44	9.0
Domestic worker (household and caregiving tasks)	193	39.3
Cleaner	26	5.3
Waiter / steward / salesperson	57	11.6
Security	3	0.6
Chef	3	0.6
Clerk / administrative / office work	14	2.9
Other	38	7.7
Income (in million rupiah; USD 1 ≈ Rp 14,400 per March 2021)		
<5	22	4.5
5,0-5,9	51	10.4
6,0-6,9	102	20.8
7,0-7,9	119	24.2
8,0-8,9	105	21.4
9,0 or more	92	18.7
Accommodation		
With employer (live in)	263	53.6

Place provided by the employer	28	5.7
Boarding with friends	168	34.2
Boarding with family	32	6.5
<hr/>		
Insurance ownership		
I do not know/not sure	117	23.8
No insurance	67	13.6
Medical insurance (standard—for accidents during work)	194	39.5
Medical insurance (comprehensive—general health)	83	16.9
No insurance but can reimburse to the employer	30	6.1
<hr/>		
Province of origin		
West Java	30	6.1
Central Java	133	27.1
East Java	213	43.4
Other provinces	115	23.4
<hr/>		
Educational level		
Elementary	35	7.1
Junior High school	169	34.4
Senior High School/Vocational	244	49.7
Diploma	22	4.5
Undergraduate	18	3.7
Postgraduate	3	0.6
<hr/>		
Marital status		
Non-married	323	65.8
Married	168	34.2
<hr/>		
Sexual orientation		
Heterosexual	437	89.0
Homosexual	34	6.9
Bisexual	20	4.1
<hr/>		
Mental disorder history (yes)	18	3.7
<hr/>		
Language fluency (from 1 = not fluent at all to 4 = very fluent)	M	SD
English reading and listening fluency	2.8	0.8
English writing and speaking fluency	2.7	0.8
Cantonese reading and listening fluency	2.8	0.8
Cantonese writing and speaking fluency	2.5	0.9
Mandarin reading and listening fluency	1.8	0.9
Mandarin writing and speaking fluency	1.6	0.8

Table 2. The prevalence of anxiety and depression symptoms based on the characteristics of participants

Variables	Categories	Anxiety symptoms		Depression symptoms	
		<i>f</i>	%	<i>f</i>	%
Age	≤36 years old	109	43.6	96	38.4
	>36 years old	47	19.5	36	14.9
Sex	Female	155	34.3	128	28.3
	Male	1	2.6	4	10.3
Location	Macau	85	29.6	73	25.4
	Non-Macau	71	34.8	59	28.9
length of stay	<6 years	105	38.2	86	31.3
	≥6 years	51	23.6	46	21.3
type of job	Domestic and care work	126	36.0	105	30.0
	Non-domestic and care work	30	21.3	27	19.1
Income per month	<7 million rupiah	79	45.1	68	38.9
	≥7 million rupiah	77	24.4	64	20.3
Accommodation	Live-in (with employer)	94	35.7	78	29.7
	Non-live-in	62	27.2	54	23.7
Insurance ownership	No insurance	75	35.0	65	30.4
	Have insurance	81	29.2	67	24.2
Province of origin	Non-Java provinces	47	33.6	40	28.6
	Java provinces	109	31.1	92	26.2
Educational level	Lower than senior high school	88	43.1	74	36.3
	Senior high school and higher	68	23.7	58	20.2
Marital status	Non-married	129	39.9	114	35.3
	Married	27	16.1	18	10.7
Sexual orientation	Heterosexual	135	30.9	110	25.2
	Non-heterosexual	21	38.9	22	40.7
Mental disorder history	No history	145	31.5	125	27.1
	Have history	11	36.7	7	23.3
English reading and listening fluency	Poor	70	38.7	63	34.8
	Good	86	27.7	69	22.3
English writing and speaking fluency	Poor	80	39.8	75	37.3
	Good	76	26.2	57	19.7
Cantonese reading and listening fluency	Poor	68	40.2	65	38.5
	Good	88	27.3	67	20.8
Cantonese writing and speaking fluency	Poor	95	39.9	85	35.7
	Good	61	24.1	47	18.6
Mandarin reading and listening fluency	Poor	136	34.5	117	29.7
	Good	20	20.6	15	15.5

Variables	Categories	Anxiety symptoms		Depression symptoms	
		<i>f</i>	%	<i>f</i>	%
Mandarin writing and speaking fluency	Poor	138	33.7	117	28.6
	Good	18	22.0	15	18.3

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Table 3. Hierarchical logistic regression models predicting anxiety and depression symptoms

Variables & categories	Model 0			Model 1			Model 2			Model 3			Model 4		
Anxiety symptoms	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
Block 1															
Age (≤36 vs >36 years old)	0.31	0.21-0.47	<.001	0.39	0.26-0.60	<.001	0.45	0.29-0.69	<.001	0.47	0.31-0.73	.001	0.52	0.33-0.82	.001
Block 2															
Marital status (non-married vs married)				0.37	0.23-0.60	<.001	0.38	0.23-0.63	<.001	0.40	0.25-0.66	<.001	0.40	0.24-0.66	<.001
Income per month (<7 vs ≥7 million rupiah)							0.51	0.33-0.77	.001	0.58	0.38-0.90	.01	0.63	0.40-0.97	.04
Educational level (lower than senior high school vs senior high school and higher)										0.59	0.39-0.91	.02	0.57	0.37-0.88	.01
Cantonese writing and speaking fluency (poor vs good)													0.65	0.42-0.99	.04
R ²	0.06			0.09			0.11			0.12			0.13		
Depression symptoms	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>			
Block 1															
Age (≤36 vs >36 years old)	0.28	0.18-0.44	<.001	0.37	0.23-0.57	<.001	0.42	0.27-0.67	<.001	0.46	0.29-0.74	.001			
Block 2															
Marital status (non-married vs married)				0.29	0.16-0.50	<.001	0.28	0.16-0.48	<.001	0.27	0.15-0.48	<.001			
English writing and speaking fluency (poor vs good)							0.46	0.30-0.71	<.001	0.51	0.33-0.79	.003			
Cantonese reading and listening fluency (poor vs good)										0.59	0.37-0.93	.02			
R ²	0.07			0.11			0.14			0.15					

Note. First category is the reference for all variables.