Predictors of Anxiety and Depression Symptoms in Indonesian Migrant Workers During Early COVID-19 Pandemic

Andrian Liem[1]*
[1]Faculty of Psychology, Universitas Sebelas Maret, Central Java, Indonesia
e-mail: *andrianliem@staff.uns.ac.id*

Abstract. This study examined anxiety and depression symptoms among Indonesian migrant workers in Macau, Hong Kong, and Taiwan during the early COVID-19 pandemic. An online survey of 491 participants revealed prevalence rates of 31.8% for anxiety symptoms and 26.9% for depression symptoms. Hierarchical logistic regression analysis identified predictors for anxiety symptoms: age, marital status, income, education, and Cantonese fluency. Depression symptoms predictors included age, marital status, and English and Cantonese fluency. Older, married individuals with higher income, education, and language proficiency were less likely to experience anxiety or depression symptoms. These findings contribute to understanding mental health challenges faced by migrant workers during the early pandemic and can inform post-crisis interventions and future public health planning. Stakeholders should consider these results to develop more inclusive strategies for migrant workers in similar situations.

Keywords: foreign workers, global health, health equity, mental health services, occupational health

Abstrak. Penelitian ini memeriksa gejala kecemasan dan depresi di kalangan pekerja migran Indonesia di Makau, Hong Kong, dan Taiwan selama awal pandemi COVID-19. Survei daring terhadap 491 partisipan menunjukkan angka prevalensi sebesar 31,8% untuk gejala kecemasan dan 26,9% untuk gejala depresi. Analisis regresi logistik hirarkis mengidentifikasi beberapa prediktor dari gejala kecemasan, yaitu usia, status pernikahan, pendapatan, pendidikan, dan kefasihan bahasa Kanton. Prediktor gejala depresi termasuk usia, status pernikahan, serta kefasihan berbahasa Inggris dan Kanton. Individu yang lebih tua dan sudah menikah dengan pendapatan, pendidikan, dan kemahiran bahasa yang lebih tinggi cenderung tidak mengalami gejala kecemasan atau depresi. Temuan ini berkontribusi dalam memahami tantangan kesehatan mental yang dihadapi oleh pekerja migran selama awal pandemi dan dapat menjadi masukan untuk intervensi pascakrisis dan perencanaan kesehatan masyarakat di masa depan. Para pemangku kepentingan perlu mempertimbangkan hasil penelitian ini untuk mengembangkan strategi yang lebih inklusif bagi pekerja migran dalam situasi yang serupa.

Kata kunci: pekerja migran, kesehatan global, kesetaraan kesehatan, layanan kesehatan mental, kesehatan kerja

Introduction

The mental health of migrant workers in the Greater China area has become a critical area of research, particularly in light of the COVID-19 pandemic. Recent studies have significantly advanced our understanding of the complex interplay of factors affecting this population's psychological well-being. A growing body of evidence has identified key variables influencing anxiety and depression among migrant workers, including socioeconomic status, language proficiency, social support networks, and acculturation stress (Hall et al., 2021; Liem et al., 2021). The COVID-19 pandemic has intensified these vulnerabilities, with research indicating elevated rates of psychological distress among migrant workers due to job insecurity, social isolation, and constrained access to healthcare (Farah & Choi, 2019; A. Liem et al., 2020; Mucci et al., 2020).

Furthermore, emerging theoretical frameworks, such as the Stress-Vulnerability Model adapted for migrant populations, have provided new insights into how pre-existing mental health conditions and coping strategies influence resilience to pandemic-related stressors (Bernstein et al., 2020; Hall et al., 2021). Additionally, recent studies have begun to explore the intersectionality of multiple identities (e.g., gender, ethnicity, socioeconomic status) in shaping migrants' mental health experiences (Wong, 2023). Technological factors, including the role of digital technologies and social media in mental health support and information dissemination, have also gained attention in recent literature (Hosen et al., 2021; Andrian Liem et al., 2020).

Despite these advances, considerable research gaps remain with respect to the specific predictors of anxiety and depression among migrant workers in the Greater China area, particularly in the context of the context of the COVID-19 pandemic.

Although previous studies have explored mental health outcomes in this population, they have often concentrated on a single location or a specific migrant group, which limits the extent to which their findings can be generalized (Liu et al., 2020; Yang et al., 2022). Moreover, there is a paucity of comprehensive research examining the interplay between multiple factors, including demographic characteristics, language proficiency, and socioeconomic variables, in predicting mental health outcomes across different regions within Greater China (Garabiles et al., 2019; Lu et al., 2020). This gap in knowledge hinders the development of targeted interventions and policies to support migrant workers' mental health during global health crises.

This study aims to address the research gaps by investigating the prevalence and predictors of self-reported anxiety and depression among Indonesian migrant workers (IMWs) across multiple regions in the Greater China area during the early stages of the COVID-19 pandemic. By examining a diverse sample of IMWs in Macau, Hong Kong, and Taiwan, this research aims to provide a more comprehensive understanding of the factors influencing mental health outcomes in this population. This research is particularly significant as it focuses on the early stages of the pandemic, offering valuable insights into the immediate psychological impact of the crisis on migrant workers. These findings may inform future preparedness and response strategies, contributing to the development of more targeted and effective mental health interventions for migrant workers in the region. Furthermore, by identifying key predictors of anxiety and depression, this study aims to provide a scientific foundation for crafting culturally sensitive policies that ensure the mental well-being and enhance the resilience of migrant workers in the face of global health crises.

Method

This study surveyed IMWs in Macau, Hong Kong, and Taiwan between February and March 2020. The University of Macau's Ethics Committee approved

the study. The Indonesian Migrant Workers Union assisted in distributing the survey. The basic demographic information was asked first followed by the language fluency for three languages (English, Cantonese, and Mandarin). The Generalized Anxiety Disorder-7 (GAD-7) (Spitzer et al., 2006) was used to measure 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 (α = .88) (Marthoenis et al., 2019).

The Patient Health Questionnaire-9 (PHQ-9) (α=.86) (Kroenke & Spitzer, 2002) 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 (α = .86). (Hall et al., 2021).

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).

Result

The average age of the participants was 36 years (SD=6.3) and the majority were female (92%). Participants worked in various settings that were dominated by domestic workers (73.8%). Details of the participants' characteristics are presented in Table 1 below.

Table 1.
Characteristics of participants

Variables	f	%
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

Variables	f	%
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
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
Province of origin		
West Java	30	6.1
Central Java	133	27.1
East Java	213	43.4
Other provinces	115	23.4
Educational level		
Elementary	35	7.1
Junior High school	169	34.4
Senior High School/Vocational	244	49.7
Diploma	22	4.5

Variables	*f*	%
Undergraduate	18	3.7
Postgraduate	3	0.6
Marital status		
Non-married	323	65.8
Married	168	34.2
Sexual orientation		
Heterosexual	437	89.0
Homosexual	34	6.9
Bisexual	20	4.1
Mental disorder history (yes)	18	3.7
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

The average score of GAD-7 was 7.18 (*SD*=5.56) that 31.8% of participants were screened with anxiety. The severity level prevalence was 30.3% (mild), 19.6% (moderate), and 12.2% (severe). The average score of PHQ-9 was 6.46 (*SD*=5.54) that 26.9% of participants were screened with depression. The severity level prevalence was 28.3% (mild), 17.3% (moderate), 6.3% (moderately severe), and 3.3% (severe). 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 below.

Table 2.
The prevalence of anxiety and depression symptoms of IMWs

Variables	Categories	Anxiety symptoms		Depression symptoms	
		f	%	*f*	%
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

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

Note. 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 on a 4-point Likert scale from 1 (not fluent at all) to 4 (very fluent). On each item, scores 1 and 2 were categorized as "poor" and "good" for scores 3 and 4.

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

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

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	*p*	OR	95% CI	*p*	OR	95% CI	*p*	OR	95% CI	*p*	OR	95% CI	*p*
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
R²		0.06			0.09			0.11			0.12			0.13		
Depression symptoms	OR	95% CI	*p*	OR	95% CI	*p*	OR	95% CI	*p*	OR	95% CI	*p*			
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			
R²		0.07			0.11			0.14			0.15					

Note. The first category is the reference for all variables.

Discussion

This study assessed the prevalence and predictors of anxiety and depression symptoms among IMWs in the Greater China area during the early COVID-19 pandemic, revealing that 31.8% screened with anxiety and 26.9% with depression. These rates are higher than those observed among IMWs in South Korea (Farah & Choi, 2019) and Macau (Hall et al., 2021) during non-pandemic times. The findings are also more severe than those observed among Indonesian adolescents post-2016 Aceh Earthquake (Marthoenis et al., 2019). This current study, conducted at the pandemic's onset, noted higher symptom severity levels compared to the post-earthquake period (12.2% vs 5.0% for anxiety and 3.3% vs 0.9% for depression). These results align with other studies that have documented increased mental health challenges among migrant workers during the COVID-19 pandemic, such as Qiu et al. (2020) who found elevated rates of psychological distress among Chinese migrant workers. Furthermore, the World Health Organization (WHO, 2022) also reported that 25% global increase in anxiety and depression prevalence during the first year of the COVID-19 pandemic, with young people and women being most affected. The pandemic has also severely disrupted mental health services worldwide, leaving significant gaps in care for those who need it most.

The study also confirmed that women were more likely to experience anxiety and depression, which is consistent with findings from studies of Indonesian disaster survivors (Musa et al., 2014) and global migrant workers (Mucci et al., 2020). This gender disparity in mental health outcomes has been further corroborated by recent research, including a cross-sectional study of internal migrant workers in China found that women reported higher prevalence and severity of depressive and anxiety symptoms compared to men, which these results were associated with institutional inequalities (Hou et al., 2020). A study among migrant worker returnees in Vietnam found female returnees experienced heightened anxiety and fear during the COVID-19 pandemic, primarily due to their societal and caregiving responsibilities, which intensified their vulnerability

compared to male counterparts (Tran et al., 2024). Female migrant workers' concerns centered around family security and food shortages, reflecting the traditional roles that often place the burden of household management on women, exacerbating their psychological distress during this challenging period (Ho, 2022). These findings collectively underscore the importance of gender-sensitive approaches in addressing mental health issues among migrant worker populations, particularly during times of crisis.

Findings in this current study also indicated that age and marital status were significant predictors of anxiety and depression, corroborating earlier studies where older and married Indonesian post-tsunami survivors (Musa et al., 2014) and Korean migrants in the US (Bernstein et al., 2020) showed lower incidences of psychological disorders. The study also aligned with research suggesting that migrant workers with lower education and income levels are more prone to anxiety (Mucci et al., 2020). However, these factors did not correlate with depression, which is consistent with findings among Indonesian workers in South Korea during non-pandemic periods (Farah & Choi, 2019).

This study found that language fluency predicted anxiety and depression symptoms among IMWs during the pandemic's early stages. In particular, IMWs with local language active skills (i.e., writing and speaking in Cantonese) were less likely to experience clinically meaningful symptoms of anxiety; and they who passively fluent in the local language (i.e., reading and listening in Cantonese) and actively fluent in English (i.e., writing and speaking) were less likely to experience clinically meaningful symptoms of depression compared to IMWs with poor language fluency. These findings support earlier research linking language mastery to wellbeing, help-seeking behavior, and successful acculturation among migrants worldwide (Liem et al., 2021).

The findings of this study are also in accordance with previous research conducted in China, which indicated that language proficiency is a significant indicator of the level of acculturation (Zhong et al., 2017). In a previous study, a

comparison was made between young and old generations of migrant workers in China, which found that there was no significant correlation between self-rated Mandarin proficiency and psychological distress among the older generation of MWs (Zhong et al., 2017). The findings suggest that language barriers may diminish over time. It could be interpreted that a longer duration of migration work potentially facilitates better adaptation to the new environment, effectively reducing the impact of language proficiency on mental health outcomes for long-term migrants. In the current study, this was evidenced by the older IMWs who were less likely to show anxiety and depressive symptoms than younger IMWs.

This study has three limitations: potential self-selection bias due to convenience sampling, a male underrepresentation affecting generalizability, and its cross-sectional nature preventing causal inferences. However, the study's strengths include a large sample size from regions near the pandemic's epicenter and diverse participant demographics in terms of income and job type. The gender distribution of Indonesian migrant workers in the Greater China area, where domestic work is common, is accurately reflected by the predominance of female participants.

Conclusion

This study investigated the prevalence of anxiety and depression among IMWs during the early stages of the COVID-19 crisis. It offers insights into post-crisis interventions and emphasizes the importance of incorporating multilingual communications in public health strategies. This is particularly important for migrant workers with limited local language skills, who are at greater risk of psychological distress. It is recommended that host countries provide professional translators or interpreters in important departments and healthcare facilities to overcome language barriers.

Suggestion

Considering the study findings, three key recommendations are proposed to address mental health challenges among IMWs in the Greater China area: and for stakeholders to establish a more conducive environment that fosters enhanced mental health outcomes for IMWs in the region. Firstly, implement targeted mental health interventions for younger, single workers, who are at higher risk for anxiety and depression. This could include age-specific support groups, counseling services, and tailored stress management workshops. Secondly, enhance language support programs, focusing on Cantonese and English proficiency. This could entail the provision of professional translators or interpreters in important departments and healthcare facilities, accessible language courses, conversation practice groups, or language exchange programs, with the objective of enhancing the communication skills and cultural integration of workers. Thirdly, improve socioeconomic status through skills training, career development programs, and financial literacy workshops. These initiatives can help increase income levels and educational attainment, which were found to be protective factors against anxiety.

Declarations

Funding

This study received no funding from any institution.

Conflict of interest

The author declares no conflict of interest.

Ethics approval

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. The ethics approval was obtained from the Ethics Committee of the University of Macau.

Consent to participate

Informed consent was obtained from all participants for being included in the study.

Consent for publication

Informed consent was obtained from all participants for their data being published in the study as a group.

Availability of data and material

The data that support the findings of this study are available on request from the corresponding author.

Author's contributions

The author designed the study, collected and analyzed the data, and wrote the manuscript.

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