

Anxiety, Coping Strategies and Quality of Life of Malaysian Community During the Movement Control Order for COVID-19 Pandemic: A Web-Based Cross-Sectional Study

Anne Yee

University of Malaya Faculty of Medicine

Yu-Zhen Tung

University of Malaya Faculty of Medicine

Padma Rani Kumar

University of Malaya Faculty of Medicine

Po-Lin Ooi

University of Malaya Faculty of Medicine

Saiful Adni B Abdul Latif

Institut Kanser Negara

Husna Md Isa

Universiti Malaysia Sarawak

Diana-Leh-Ching Ng

Universiti Malaysia Sarawak Faculty of Medicine and Health Sciences

Seng-Beng Tan

University of Malaya Faculty of Medicine

Chee-Shee Chai (✉ cschai@unimas.my)

Universiti Malaysia Sarawak Faculty of Medicine and Health Sciences <https://orcid.org/0000-0002-4277-6152>

Primary research

Keywords: COVID-19, pandemic, movement control order, lockdown, anxiety, coping, quality of life, mental health

Posted Date: June 9th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-587822/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background: The Coronavirus disease 2019 (COVID-19) pandemic has led to an unprecedented series of lockdown worldwide. A nationwide full lockdown called the "Movement Control Order" (MCO) was imposed in Malaysia on 18th March 2020 following the surge in COVID-19 cases. This study aimed to investigate the anxiety, coping strategies and, quality of life (QOL) of the Malaysian community during the MCO for the COVID-19 pandemic.

Methods: This web-based cross-sectional study was conducted between April and May 2020. Questionnaires on Depression, Anxiety and Stress Scale – 21 (DASS-21), Brief-Coping Orientation to Problems Experienced (Brief-COPE), and World Health Organization Quality of Life – Brief Version (WHOQOL-BREF) were administered. Respondents were defined as having anxiety if their DASS-21 anxiety domain score was 8 and above.

Results: A total of 528 responses were received with an anxiety prevalence of 29.2%. Respondents with anxiety were significantly younger (33.40 ± 9.86 versus 36.73 ± 12.61 years, $p = 0.001$), without a partner (62.3% versus 37.7%, $p = 0.006$), lived in an area with higher incidence of COVID-19 – red zone (81.2% versus 18.8%, $p = 0.041$) and had higher avoidant coping score (median, 25 versus 20, $p < 0.001$). Logistic regression showed that living in the red zone (odds ratio = 1.78, 95% CI = 1.09, 2.91, $p < 0.001$) and used avoidant coping strategies (odds ratio = 1.12, 95% CI = 1.08, 1.16, $p < 0.001$) were independent predictors of anxiety. Respondents with anxiety had significantly lower mean scores for physical health (13.8 ± 2.59 versus 16.15 ± 2.21), psychological (13.29 ± 2.95 versus 15.84 ± 2.44), social relationships (12.88 ± 3.66 versus 15.03 ± 3.08), and environment (14.63 ± 2.31 versus 16.18 ± 2.20), all $p < 0.001$.

Conclusion: Anxiety was common during the MCO for the COVID-19 pandemic and was associated with poorer QOL. Those who lived in the area with a high incidence of COVID-19 in recent weeks and used avoidant coping strategies were more vulnerable to develop anxiety. Identification and risk stratification of individuals that prone to anxiety enables the initiation of psychological interventions to maintain mental health.

Background

The Coronavirus disease 2019 (COVID-19) is an ongoing public health emergency and pandemic. Since COVID-19 was first reported in humans in December 2019 in Wuhan, the capital city of Hubei province of China, it has rapidly spread to all parts of the world.(1) As of 23rd May 2021, COVID-19 has infected 167 million people in the world and caused 3.5 million deaths.(2) COVID-19 is an extremely contagious disease, that is transmitted from person to person via droplets, direct contact, and fomite.(3) A recent statement from the Center for Disease Control and Prevention highlighted that aerosol transmission of COVID-19 is possible outside of healthcare facilities.(4)

The COVID-19 pandemic has resulted in an unprecedented series of lockdown worldwide. Lockdown is defined as an emergency and temporary course of action implemented by the government to contain the spread of COVID-19.(5) It is mandatory and applied indiscriminately to the general population, requiring them to stay at home, and refrain from economic and social activities. Lockdown differs from quarantine, as the latter refers to the compulsory physical isolation of a group of healthy individuals who have been potentially exposed to a contagious disease.(6)

Malaysia reported the very first case of COVID-19 in January 2020. Following the spike in cases in March 2020, believed to be related to a mass gathering at Kuala Lumpur, a nationwide full lockdown called the "Movement Control Order" (MCO) was imposed on 18th March 2020.(7) Measures taken during this first MCO include 1. Prohibition of mass gatherings and movements at all locations nationwide. 2.) Closure of all government, private and business premises except those providing essential services. 3. Closure of educational institutions at all levels. 4. Travel restrictions and mandatory 14-days quarantine upon return to Malaysia for citizens, as well as banning foreign visitors from entering Malaysia.(8) The first MCO had successfully reduced the number of COVID-19 in the country and was ended on 3rd May 2020.(9) Subsequently, the second MCO and the third MCO, which involved partial lockdown of some states in Malaysia were implemented on 13th January 2021 and 12th May 2021, respectively, following a surge in COVID-19 cases again.(9)

Anxiety is a normal adaptive emotion that promotes survival by triggering a person to stay away or escape a hazardous place.(10) Moderate levels of anxiety in community have been shown to be associated with more comprehensive precautions against infections.(11) Studies have reported significant negative psychological impact, such as depression, anxiety, as well as post-traumatic stress disorder in individuals quarantined during the severe acute respiratory syndrome (SARS), middle east respiratory syndrome (MERS), Ebola, and influenza epidemic.(12) Stressors identified for adverse psychological impact include the fears of infection, inadequate supplies, inadequate information, boredom, financial constraint, as well as the length of time in the isolation.(12)

Coping strategies refer to the methods an individual uses to manage stressors.(13) An individual's choice of coping strategies may vary depending on their appraisal of the particular situation they are facing. Problem-focused coping strategies may be preferable in a more controlled situation, whereas emotion-focused coping may be beneficial in situations perceived as uncontrolled.(13) Adults with a greater tolerance of uncertainty during the H1N1 influenza epidemic had lower levels of problem-focused coping and were more likely to use emotion-focused coping, resulting in higher levels of anxiety.(14) On the other hand, a group of students who used avoidant coping strategies during the initial phase of the SARS epidemic in Hong Kong reported lower levels of anxiety.(15) A recent study of nurses and nursing students in China during the COVID-19 pandemic showed that those who used problem-focused coping had higher levels of anxiety.(16) These conflicting findings across different population characteristics and context support the need to examine the impact of different coping strategies in local populations.

Quality of life (QOL) is defined as an individual's overall perception and satisfaction with how things are in their life.(17) A systematic review of several longitudinal studies found that anxiety is often associated with poor QOL.(18) Isolation and quarantine as an infectious disease precaution have been shown to be associated with anxiety and to impair QOL.(12, 19)

To date, studies on mental health and QOL during the COVID-19 pandemic have mainly focused on healthcare workers or in general.(20, 21) Studies looking at the anxiety and QOL of the public in the midst of lockdown due to the COVID-19 pandemic are still lacking, especially in the Southeast Asia region. Therefore,

we conducted this study that aimed to determine the impact of the first MCO for the COVID-19 pandemic on the Malaysian population's anxiety levels and QOL, as well as to assess the differences in associated factors and coping strategies between people with and without anxiety.

Methods

Study design and population

This was a cross-sectional study conducted nationwide in Malaysia from April 2020 to May 2020. Respondent-driven sampling was used to recruit the samples. Inclusion criteria were Malaysian citizens, who were at least 18 years old, able to read English or Malay, and already resided in Malaysia before the COVID-19 pandemic. Exclusion criteria were samples with an underlying psychiatric disorder, chronic debilitating physical illness, being investigated for COVID-19, or have been diagnosed with COVID-19, any of which could be individually associated with anxiety.

Sample size calculation

The sample size was calculated based on a formula for a cross-sectional study.(22) The type-1 error was 5%, the absolute error was 5%, and the expected proportion of anxiety in the general population during the COVID-19 pandemic was 35.6%, based on one study.(20) A minimum sample size of 353 subjects was required for this study.

Measures

Relevant socio-demographic and COVID-19 related information was obtained from the respondents. The socio-demographic information included age, gender, ethnicity, religion, marital status, education level, employment status, and household income. The COVID-19 related information included whether the respondents were frontline workers and the respondents' place of residence according to the color coding assigned by the Malaysia Ministry of Health. For the household income, T20 was defined as the top 20%, M40 was defined as the middle 40%, and B40 was defined as the lower 40% of family income in Malaysia.(23) Frontline workers were defined as individuals who have direct contact with potential COVID-19 patients due to their occupation.(24) The color coding of place of residence was defined based on the cumulative cases of locally transmitted COVID-19 in the past 14 days, with the red zone having more than 40 cases, the yellow zone having 40 cases or less, and the green zone being free of COVID-19.

Study instruments

Depression, Anxiety and Stress Scale (DASS-21)

The DASS-21 is an abbreviated version of the original 42-item DASS score.(25) It is a simple and concise self-administered instrument that can be used to screen for depression, anxiety, and stress. The sum scores are calculated by adding the item scores for each subscale and multiplying by a factor of 2. Thus, the sum scores for the DASS-total scale, range from 0 to 120, and those for the individual subscales can range from 0 to 42. The higher scores reflect the severity of the depression, anxiety, and stress. In this study, we focus on the anxiety domain, which is normal (0–7), mild (8–9), moderate (10–14), severe (15–19) and, extremely severe (≥ 20). Subjects were defined as having anxiety if their DASS-21 anxiety domain score was 8 and above. The anxiety subscale has an excellent Cronbach's alpha of 0.89. The Malay version was developed and validated for local use.(26)

Brief-COPE (Coping Orientation to Problems Experienced) Inventory

Brief-COPE is a 28-item self-reported questionnaire to assess a broad range of coping responses to stress.(27) Although 14 coping subscales and two items each were described by the original author, the scale can roughly determine a person coping styles as either approach coping, or avoidant coping.(28) Approach coping includes active coping (items 2 and 7), emotional support (items 5 and 15), use of information support (items 10 and 23), positive reframing (items 12 and 17) and acceptance (items 20 and 24). Avoidant coping includes denial (items 3 and 8), substance use (items 4 and 11), behavioral disengagement (items 6 and 16), venting (items 9 and 21), and self-blame (items 13 and 26). Humor (items 18 and 28) and religion (items 22 and 27) are neither approaches nor avoidance coping. The overall Cronbach's alpha of Brief-COPE is 0.70, with 14 subscales and a range of 0.44–0.89. The Malay version of Brief-Cope has been validated locally.(29)

World Health Organization Quality of Life Brief Version: (WHOQOL)-BREF

The WHOQOL-BREF was developed to provide a more abbreviated instrument to measure the QOL. WHOQOL-BREF contains only 26 items: 1 item from each of the 24 facets, in addition to the 2 items from the total QOL and the general health facet. The 24 items in the WHOQOL-BREF can be grouped into 4 domains, namely physical health, psychological, social relationships, and environment. The WHOQOL-BREF domain scores correlate highly with the WHOQOL-100 domain scores (≥ 0.89), with good discriminant validity, content validity, internal consistency, and test-retest reliability.(30) The overall Cronbach's alpha for WHOQOL-BREF is 0.89, with a range of 0.71–0.81 for each domain. The Malay version of the WHOQOL-BREF showed satisfactory psychometric properties similar to its English counterpart and is recommended for use in epidemiological as well as in intervention studies.(31)

Study procedures

To contain the spread of COVID-19 by contact or droplets, we used a web-based survey to collect data. Respondents were recruited through advertisements posted on the mobile WhatsApp. Respondents were asked to complete an online consent form after confirming that they understood the purpose, as well as the risks and benefits of the study. The anonymous self-administered online questionnaire was administered in both English and validated Malay languages, and took approximately 15–20 minutes to complete. No incentives were offered for completing the survey.

Statistical analysis

The data were analyzed by using the Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics were used to summarize the data. The socio-demographic, COVID-19 related variables, and Brief-COPE differences between respondents with and without anxiety were assessed via bivariate analyses, using Chi-square tests or Fisher's exact tests for categorical variables, and independent t-tests or Mann-Whitney U-tests for continuous variables. Variables with significant differences were further analyzed using the logistic regression method. Multiple linear regression analysis was then performed to examine the relationship between the significant variables and anxiety level. To assess the QOL, an analysis of Covariance (ANCOVA) was conducted to examine the differences in each domain of the WHOQOL-BREF between respondents with and without anxiety, while controlling for covariates. Pearson correlation was then used to examine the relationship between WHOQOL-BREF and anxiety level. Statistical significance in this study was set at $p < 0.05$ for two-sided tests. A multi-test correction was performed by using the Bonferroni method.

Ethical consideration

This online survey was anonymous. The study was approved by the Medical Ethics Committee of the University Malaya Medical Center (MREC ID NO202048-8477). The study was conducted in accordance with the Declaration of Helsinki.

Results

Of 578 subjects approached, 574 (99.3%) had completed the online consent form and questionnaires. A total of 528 (91.4%) of them met the inclusion criteria and were included. The respondents had a mean age of 35.75 ± 11.96 years, duration under MCO of 48.54 ± 6.11 days, and household size of 4.26 ± 2.12 persons (Table 1). The majority of them had never been under health quarantine ($n = 485, 91.9\%$), not front-line workers ($n = 468, 88.6\%$) and had education up to tertiary level ($n = 477, 90.3\%$). More than half of the respondents were female ($n = 328, 62.1\%$), lived in the red zone ($n = 397, 75.2\%$) and were employed ($n = 327, 61.9\%$). Almost half of the respondents were Chinese ($n = 237, 44.9\%$), single ($n = 261, 49.4\%$), and belonged to the B40 household income ($n = 226, 42.8\%$).

One hundred and fifty-four (29.2%) respondents were classified as having anxiety. Of these, 40 (26.0%), 71 (46.1%), 13 (8.4%), 30 (19.5%) were classified as mild, moderate, severe and extremely severe, respectively. The respondents with anxiety were significantly younger than those without anxiety [mean age, 33.40 ± 9.86 versus 36.73 ± 12.61 years, $t(361.60) = 3.24, p = 0.001$] (Table 2). Respondents without a partner were significantly more likely to have anxiety compared to respondents with a partner [62.3% versus 37.7%, $\chi^2(1, N = 528) = 7.56, p = 0.006$]; while respondents who lived in the red zone were significantly more likely to have anxiety than respondents who lived in the non-red zone [81.2% versus 18.8%, $\chi^2(1, N = 528) = 4.17, p = 0.041$]. Respondents with anxiety had significantly higher avoidant coping scores than those without anxiety (median, 25 versus 20, $U = 17282, p < 0.001$).

The logistic regression predicting anxiety based on participants' age, marital status, living zone, and the avoidant coping score was statistically significant, $\chi^2(4) = 60.96, p < 0.001$ (Table 3). The model explained 15.6% (Nagelkerke R^2) of the variance in anxiety and correctly classified 71.20% of cases. Living in red zone (odds ratio, 1.78; 95% CI, 1.09–2.91; $p = 0.02$) and adopting avoidant coping (odds ratio, 1.12; 95% CI 1.08–1.16; $p < 0.001$) were independently associated with anxiety.

The multiple linear regression predicting anxiety score based on participants' age, marital status, living zone, and avoidant coping score was also statistically significant, [$F(4,518) = 24.93, p < 0.001$], with an adjusted R^2 of 0.16 (Table 4). Both living in the red zone, and the avoidant coping scores were significant predictors of anxiety scores. Participants' predicted anxiety score equaled to $-2.90 + 1.28(\text{zone}) + 0.38(\text{avoidant})$. Anxiety score increased by 1.28 for those in the red zone and by 0.38 for each avoidant coping score point.

A one-way ANCOVA was conducted to determine a statistically significant difference between the WHOQOL-BREF domain on participants with and without anxiety, controlling for age, marital status, living zone, and avoidant coping score. Respondents with anxiety had significantly lower mean scores for physical health (13.8 ± 2.59 versus 16.15 ± 2.21 ; adjusted difference -1.87), psychological (13.29 ± 2.95 versus 15.84 ± 2.44 ; adjusted difference -1.90), social relationships (12.88 ± 3.66 versus 15.03 ± 3.08 ; adjusted difference -2.15) and environment (14.63 ± 2.31 versus 16.18 ± 2.20 ; adjusted difference -1.23) compared to those without anxiety, all $p < 0.001$ (Table 5).

There were strong negative correlations between anxiety and the WHOQOL-BREF physical health domain ($r = -0.500, p < 0.001$). Anxiety had moderate negative correlation with WHOQOL-BREF psychological, social relationships and environment domain scores ($r = -0.472, r = -0.361, r = -0.336$, all $p < 0.001$).

Discussion

The COVID-19 pandemic invariably leads to lockdown in many countries all over the world. During the first MCO for the COVID-19 pandemic in Malaysia, nearly one-third of the respondents in this study experienced anxiety, the majority of whom were mildly to moderately anxious. Anxiety was significantly more common among respondents who were in the red zone and used avoidant coping strategies. Anxiety was also more common among those who were younger and did not have a partner. The overall QOL, as well as physical and mental health, social relationships, and environmental satisfaction were significantly worse among respondents who had anxiety.

The proportion of respondents with anxiety in our study was higher than the prevalence of anxiety symptoms (6–8%) in the general Malaysian population.(32) The prevalence and severity of anxiety in our respondents were similar to those in China, Japan, and Spain during the lockdown for the COVID-19 pandemic, ranging from 23.8 to 37.4%.(33–36) However, the prevalence of anxiety was higher in Iran (50.9%),(37) but lower in United Kingdom (21.6%),(38) and Italy (18.7%)(39) during the COVID-19 pandemic lockdown. The heterogeneous epidemiological distribution of anxiety in these countries during the lockdown could be attributed to several factors,(40) including the characteristics of the study population, and the burden of the disease in the region at the time of the study. (41) Compared to Malaysia, the incidence and mortality of COVID-19 were remarkably higher in the Iranian population during the study period, explaining the higher prevalence of anxiety among them.(37) The lower prevalence of anxiety in the population of United Kingdom and Italy may be due to the fact that the

former study only included individuals with high and very high anxiety level,(38) while the latter study used a different instruments, the General Anxiety Disorder 7-items scale.(39)

Our study showed that anxiety was significantly more prevalent among respondents who resided in the area with a higher incidence of COVID-19 in recent weeks. A nationwide study among Chinese in China, Hong Kong, Macau, and Taiwan during the lockdown reported that respondents from the area with a more severe epidemic of COVID-19 such as Hubei province had significantly more psychological distress ($p < 0.001$). (42) Lai et al reported that healthcare workers in Wuhan were significantly vulnerable to adverse mental health outcomes such as anxiety ($p < 0.001$), depression ($p < 0.001$), and insomnia ($p = 0.001$) when compared to those working in other parts of China.(43) Liu et al reported that medical personnel in the Hubei province of China had significantly higher anxiety scores ($p = 0.001$) compared to their counterparts in other parts of China.(44) The higher prevalence of psychological distress such as anxiety among people staying in the area with a high incidence of COVID-19 during the lockdown may be due to their intensified thoughts about the virus. A study conducted among people in India during the COVID-19 pandemic highlighted more than 80% were preoccupied with the thought of COVID-19, 72% reported the need to use gloves and sanitizers, 37.8% were paranoid about contracting COVID-19, and 36.4% had distress related to social media.(45) Another study in China concluded that people who spent more time engaging in COVID-19 (≥ 3 hours per day) were more likely to suffer from general anxiety disorders ($p < 0.001$). (20)

During the MCO for the COVID-19 pandemic, anxiety was significantly more common among Malaysians who used avoidant coping strategies compared to other coping strategies. A study in the United Kingdom reported that avoidant behaviors during the COVID-19 pandemic lockdown was positively associated with all indices of distress including anxiety, and negatively associated with well-being.(46) A similar result was also reported during the COVID-19 pandemic lockdown in Italy, whereby healthy individuals' anxiety scores were positively correlated with the avoidant coping strategies ($r = 0.35$, $p = 0.016$). (47) In Japan, three-quarters of healthcare workers used the escape-avoidance strategies to cope with stress during the COVID-19 pandemic. Two-thirds of them reported poor mental health with anxiety being the predominant symptom.(48) Carver and Pozo had highlighted that distress and coping were interdependent, with distress leading to dysfunctional coping, and causing a higher levels of distress.(49) Coping associated with distress was often passive and avoidant, such as mental and behavioral disengagement, denial, and alcohol use.

Several studies have highlighted younger age as an independent predictor of anxiety during the COVID-19 pandemic lockdown.(20, 33, 37–39) Even in the general population, epidemiological surveys consistently reported that current, as well as lifetime anxiety disorders, were more common in younger adults.(50, 51) The age-related psychological, social changes or a cohort effect could be the explanation.(52) Besides, the tendency of young people to receive a large amount of information via social platforms can easily cause stress and anxiety in them.(53) Information about COVID-19 during the pandemic and lockdown is frequently distressing and sometimes associated with rumors.(37) The age factor did not emerge as a significant predictor of anxiety in the current study, which may be confounded by the higher prevalence of staying in the red zone and adopting avoidant coping strategies among the younger respondents.

A local study showed that generalized anxiety disorder was significantly more common among singles, widows, widowers, and divorcees.(54) Similarly, another study showed that being with others reduced anxiety more effectively than being alone .(55) During the COVID-19 pandemic lockdown, loneliness was a strong predictor of anxiety, depression, and post-traumatic stress disorder among Spaniards.(56) In the current study, marital status did not emerge as a significant predictor of anxiety, which is consistent with reports from China and Turkey during the COVID-19 pandemic lockdown.(57, 58) This could be explained by the possibility of different sources of social support that could have varying degrees of influence on an individual, apart from a partner or spouse.(36) Therefore, future studies could examine different types of social support that could also contribute to coping strategies.

A web-based global multicenter study by Ammar et al. reported lower satisfaction with QOL among people from Europe, North Africa, Western Asia, and America during the lockdown for the COVID-19 pandemic.(59) People in Portugal who were quarantined at home because of the COVID-19 pandemic also reported a significant decline in their QOL.(60) On the other hand, 65% of respondents from China were satisfied with their QOL during the COVID-19 pandemic lockdown.(61) The mixed results from the different studies limit the generalizability of the findings, and therefore justify the need to investigate the QOL during the COVID-19 pandemic in our local setting. The current study showed a significant negative correlation between anxiety scores and each domain of the WHOQOL-BREF. This result was similar to a study conducted in Spain before the COVID-19 pandemic that involved 1,241 individuals who were receiving psychological treatment for emotional problems such as depression, anxiety, or somatic symptoms.(62) The reported negative correlation between anxiety and WHOQOL-BREF domains was psychological (b , -0.11), physical (b , -0.11), and environmental (b , -0.14), all $p < 0.001$. This finding is alarming because anxiety symptoms in the general population during the COVID-19 pandemic lockdown had a similar impact on QOL as in a population receiving psychological treatment. It raised a question of whether we had conducted adequate psychological screening in the at-risk population during the COVID-19 pandemic before they developed long-term sequelae.

Our study has several advantages that worth highlighting. First, an adequate sample size facilitated the generalizability of our study results. Our study was initiated during the initial phase of the first MCO, which allowed us to examine the immediate psychological and coping responses in the Malaysian population. Furthermore, our study was conducted via an online platform, which facilitated respondents' participation, and reduced drop-out rates. The online questionnaires were available in English and validated the Malay version, which is also the local language of the country.

There were also some limitations that needed to be addressed. Since our study questionnaires were online basis, we were unable to reach communities that did not have access to internet, such as those living in rural areas. It was also possible that the respondents were limited to only those who were well-educated to answer these questions, as it required literacy in one of the two languages offered. This could explain why the majority of our respondents were of tertiary-level education. Our study also did not ask about respondents' specific fears and concerns during the COVID-19 pandemic MCO. Due to the nature of this cross-sectional study, no true causality can be established between respondents' psychological and coping responses and the impact on their QOL. The use of convenience sampling makes this study vulnerable to selection bias and influences that were beyond the control of the researchers. There was also the possibility of response and recall error among respondents, as some questionnaires required them to recall events that occurred two weeks ago.

Conclusion

There was a significant increase in the prevalence of anxiety in the Malaysian population during the first MCO for the COVID-19 pandemic. Living in the red zone and using an avoidant coping strategy were independently associated with higher anxiety scores. Anxiety is negatively associated with QOL across all the domains. In the current crisis of prioritizing medical resources for the containment and treatment of COVID-19, identification and risk stratification of individuals who are vulnerable to psychological disorders such as anxiety is critical, so that appropriate psychological strategies and interventions can be implemented to maintain mental health. When resources for psychological services are limited, improving self-coping strategies is critical to alleviate the psychological distress of individuals and prepare them to be more resilient in the face of adversity.

Abbreviations

COVID 19, Coronavirus disease 2019; MCO, movement control order; SARS, severe acute respiratory syndrome; MERS, middle east respiratory syndrome; QOL, quality of life; T20, top 20% of family income; M40, middle 40% of family income; B40, lower 40% of family income; DASS-21, Depression, Anxiety and Stress Scale – 21; Brief-COPE, Coping Orientation to Problems Experienced; WHOQOL-BREF, World Health Organization Quality of Life Brief Version; SPSS, Statistical Package for the Social Sciences; ANCOVA, analysis of Covariance; SD, standard deviation; IQR, interquartile range.

Declarations

Ethics approval and consent to participate:

This online survey was anonymous. The study was approved by the Medical Ethics Committee of the University Malaya Medical Centre (MREC ID NO202048-8477). The study was conducted in accordance to the Declaration of Helsinki. Participant consents were obtained.

Consent for publication

Not applicable.

Availability of data and materials

Data will be available upon reasonable request sent to the corresponding author.

Competing interests

The authors report no conflict of interest.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

All the authors in this study contributed equally to conception and design of the study, acquisition of data and analysis, drafting of manuscript, revising it, final approval of the manuscript and will take public responsibility for its contents.

Acknowledgements

We want to express our gratitude to all the respondents who had participated in the study.

References

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020;395(10223):497-506.
2. Worldometer. COVID-19 Coronavirus Pandemic. 2021. <https://www.worldometers.info/coronavirus/>. Accessed 23 May 2021.
3. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. *New England Journal of Medicine*. 2020;382(13):1199-207.
4. Centers for Disease Control and Prevention. Scientific Brief: SARS-CoV-2 Transmission. 2021. <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html>. Accessed 20 May 2021.
5. Haider N, Osman AY, Gadzekpo A, Akipede GO, Asogun D, Ansumana R, et al. Lockdown measures in response to COVID-19 in nine sub-Saharan African countries. *BMJ Global Health*. 2020;5(10):e003319.
6. Barbera J, Macintyre A, Gostin L, Inglesby T, O'Toole T, DeAtley C, et al. Large-scale quarantine following biological terrorism in the United States: scientific examination, logistic and legal limits, and possible consequences. *Jama*. 2001;286(21):2711-7.
7. Tang KHD. Movement control as an effective measure against Covid-19 spread in Malaysia: an overview. *Z Gesundh Wiss*. 2020:1-4.
8. New Strats Time. Covid-19: Movement Control Order imposed with only essential sectors operating New Strait Times. 2020. <https://www.nst.com.my/news/nation/2020/03/575177/covid-19-movement-control-order-imposed-only-essential-sectors-operating>. Accessed 10 May

2021.

9. Wikipedia. Malaysian movement control order 2021. https://en.wikipedia.org/wiki/Malaysian_movement_control_order#:~:text=The%20Malaysian%20Government%20Movement%20Control,country%20on%20Accessed 20 May 2021.
10. Crocq M-A. A history of anxiety: from Hippocrates to DSM. *Dialogues Clin Neurosci.* 2015;17(3):319-25.
11. Leung GM, Lam T-H, Ho L-M, Ho S-Y, Chan BHY, Wong IOL, et al. The impact of community psychological responses on outbreak control for severe acute respiratory syndrome in Hong Kong. *Journal of Epidemiology and Community Health.* 2003;57(11):857-63.
12. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet.* 2020;395(10227):912-20.
13. Lazarus R, Folkman. *Stress, appraisal, and coping.* 1974.
14. Taha S, Matheson K, Cronin T, Anisman H. Intolerance of uncertainty, appraisals, coping, and anxiety: the case of the 2009 H1N1 pandemic. *Br J Health Psychol.* 2014;19(3):592-605.
15. Cheng C, Cheung MW. Psychological responses to outbreak of severe acute respiratory syndrome: a prospective, multiple time-point study. *Journal of personality.* 2005;73(1):261-85.
16. Huang L, Lei W, Xu F, Liu H, Yu L. Emotional responses and coping strategies in nurses and nursing students during Covid-19 outbreak: A comparative study. *PloS one.* 2020;15(8):e0237303-e.
17. Wood-Dauphinée S, Exner G, Bostanci B, Exner G, Glass C, Jochheim KA, et al. Quality of life in patients with spinal cord injury—basic issues, assessment, and recommendations. *Restorative neurology and neuroscience.* 2002;20(3-4):135-49.
18. Hohls JK, König H-H, Quirke E, Hajek A. Association between anxiety, depression and quality of life: study protocol for a systematic review of evidence from longitudinal studies. *BMJ Open.* 2019;9(3):e027218.
19. Sharma A, Pillai DR, Lu M, Doolan C, Leal J, Kim J, et al. Impact of isolation precautions on quality of life: a meta-analysis. *Journal of Hospital Infection.* 2020;105(1):35-42.
20. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.* 2020;288:112954-.
21. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain Behav Immun.* 2020:S0889-1591(20)30845-X.
22. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med.* 2013;35(2):121-6.
23. Che Sulaiman NF, Sanusi NA, Muhamad S. Survey dataset of Malaysian perception on rising cost of living. *Data in Brief.* 2020;28:104910.
24. Jecker NS, Wightman AG, Diekema DS. Prioritizing Frontline Workers during the COVID-19 Pandemic. *The American Journal of Bioethics.* 2020:1-5.
25. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy.* 1995;33(3):335-43.
26. Rusli BN, Amrina K, Trived S, Loh KP, Shashi M. Construct validity and internal consistency reliability of the Malay version of the 21-item depression anxiety stress scale (Malay-DASS-21) among male outpatient clinic attendees in Johor. *The Medical journal of Malaysia.* 2017;72(5):264-70.
27. Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. *International journal of behavioral medicine.* 1997;4(1):92-100.
28. Eisenberg SA, Shen BJ, Schwarz ER, Mallon S. Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of behavioral medicine.* 2012;35(3):253-61.
29. N Yusoff, WY Low, Yip C. Reliability and Validity of the Malay Version of Brief COPE Scale: A Study on Malaysia Women Treated with Adjuvant Chemotherapy for Breast Cancer *Malaysian Journal of Psychiatry Ejournal.* 2009;18(1).
30. Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group. *Psychological medicine.* 1998;28(3):551-8.
31. Hasanah CI, Naing L, Rahman AR. World Health Organization Quality of Life Assessment: brief version in Bahasa Malaysia. *The Medical journal of Malaysia.* 2003;58(1):79-88.
32. Wong CH, Sultan Shah ZU, Teng CL, Lin TQ, Majeed ZA, Chan CW. A systematic review of anxiety prevalence in adults within primary care and community settings in Malaysia. *Asian journal of psychiatry.* 2016;24:110-7.
33. Ahmed MZ, Ahmed O, Aibao Z, Hanbin S, Siyu L, Ahmad A. Epidemic of COVID-19 in China and associated Psychological Problems. *Asian journal of psychiatry.* 2020;51:102092.
34. Ueda M, Stickley A, Sueki H, Matsubayashi T. Mental Health Status of the General Population during the COVID-19 Pandemic: A Cross-sectional National Survey in Japan. *medRxiv.* 2020:2020.04.28.20082453.
35. Odriozola-González P, Planchuelo-Gómez Á, Irujo MJ, de Luis-García R. Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. *Psychiatry Res.* 2020;290:113108-.
36. Ni MY, Yang L, Leung CMC, Li N, Yao Xi, Wang Y, et al. Mental Health, Risk Factors, and Social Media Use During the COVID-19 Epidemic and Cordon Sanitaire Among the Community and Health Professionals in Wuhan, China: Cross-Sectional Survey. *JMIR Ment Health.* 2020;7(5):e19009.
37. Moghanibashi-Mansourieh A. Assessing the anxiety level of Iranian general population during COVID-19 outbreak. *Asian journal of psychiatry.* 2020;51:102076-.

38. Shevlin M, Nolan E, Owczarek M, McBride O, Murphy J, Gibson Miller J, et al. COVID-19-related anxiety predicts somatic symptoms in the UK population. *British Journal of Health Psychology*.n/a(n/a).
39. Mazza C, Ricci E, Biondi S, Colasanti M, Ferracuti S, Napoli C, et al. A Nationwide Survey of Psychological Distress among Italian People during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors. *International journal of environmental research and public health*. 2020;17(9).
40. Hossain MM, Tasnim S, Sultana A, Faizah F, Mazumder H, Zou L, et al. Epidemiology of mental health problems in COVID-19: a review. *F1000Research*. 2020;9:636.
41. Taylor MR, Agho KE, Stevens GJ, Raphael B. Factors influencing psychological distress during a disease epidemic: Data from Australia's first outbreak of equine influenza. *BMC Public Health*. 2008;8(1):347.
42. Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General psychiatry*. 2020;33(2):e100213.
43. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Network Open*. 2020;3(3):e203976-e.
44. Liu C-Y, Yang Y-Z, Zhang X-M, Xu X, Dou Q-L, Zhang W-W, et al. The prevalence and influencing factors in anxiety in medical workers fighting COVID-19 in China: a cross-sectional survey. *Epidemiol Infect*. 2020;148:e98-e.
45. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian journal of psychiatry*. 2020;51:102083-.
46. Dawson DL, Golijani-Moghaddam N. COVID-19: Psychological flexibility, coping, mental health, and wellbeing in the UK during the pandemic. *Journal of Contextual Behavioral Science*. 2020;17:126-34.
47. Mariani R, Renzi A, Di Trani M, Trabucchi G, Danskin K, Tambelli R. The Impact of Coping Strategies and Perceived Family Support on Depressive and Anxious Symptomatology During the Coronavirus Pandemic (COVID-19) Lockdown. *Frontiers in Psychiatry*. 2020;11(1195).
48. Tahara M, Mashizume Y, Takahashi K. Coping Mechanisms: Exploring Strategies Utilized by Japanese Healthcare Workers to Reduce Stress and Improve Mental Health during the COVID-19 Pandemic. *International journal of environmental research and public health*. 2020;18(1).
49. Carver CS, Pozo C, Harris SD, Noriega V, Scheier MF, Robinson DS, et al. How coping mediates the effect of optimism on distress: a study of women with early stage breast cancer. *Journal of personality and social psychology*. 1993;65(2):375-90.
50. Andrews G, Henderson S, Hall W. Prevalence, comorbidity, disability and service utilisation. Overview of the Australian National Mental Health Survey. *The British journal of psychiatry : the journal of mental science*. 2001;178:145-53.
51. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry*. 2005;62(6):593-602.
52. Flint AJ. Epidemiology and comorbidity of anxiety disorders in later life: implications for treatment. *Clinical neuroscience (New York, NY)*. 1997;4(1):31-6.
53. Cheng Cheng HJ, Liang Baoyong. Psychological Health Diathesis Assessment System: A Nationwide Survey of Resilient Trait Scale for Chinese Adults. *Studies of Psychology and Behavior*. 2014;12(6):735-42.
54. Kader Maideen SF, Mohd Sidik S, Rampal L, Mukhtar F. Prevalence, associated factors and predictors of anxiety: a community survey in Selangor, Malaysia. *BMC psychiatry*. 2015;15:262.
55. Wrightsman Jr LS. Effects of waiting with others on changes in level of felt anxiety. *The Journal of Abnormal and Social Psychology*. 1960;61(2):216-22.
56. González-Sanguino C, Ausín B, Castellanos M, Saiz J, López-Gómez A, Ugidos C, et al. Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. *Brain Behav Immun*. 2020;87:172-6.
57. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *International journal of environmental research and public health*. 2020;17(5):1729.
58. Özdin S, Bayrak Özdin Ş. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *The International journal of social psychiatry*. 2020;66(5):504-11.
59. Ammar A, Chtourou H, Boukhris O, Trabelsi K, Masmoudi L, Brach M, et al. COVID-19 Home Confinement Negatively Impacts Social Participation and Life Satisfaction: A Worldwide Multicenter Study. *International journal of environmental research and public health*. 2020;17(17):6237.
60. Ferreira LN, Pereira LN, da Fé Brás M, Ilchuk K. Quality of life under the COVID-19 quarantine. *Quality of Life Research*. 2021;30(5):1389-405.
61. Wang X, Lei SM, Le S, Yang Y, Zhang B, Yao W, et al. Bidirectional Influence of the COVID-19 Pandemic Lockdowns on Health Behaviors and Quality of Life among Chinese Adults. *International journal of environmental research and public health*. 2020;17(15).
62. González-Blanch C, Hernández-de-Hita F, Muñoz-Navarro R, Ruíz-Rodríguez P, Medrano LA, Cano-Vindel A. The association between different domains of quality of life and symptoms in primary care patients with emotional disorders. *Scientific Reports*. 2018;8(1):11180.

Tables

Table 1

Demographic Characteristics of the Malaysia Community during the MCO for COVID-19 Pandemic

	Frequency (n) or mean	Percent (%)
Age, y, mean \pm SD	35.75 \pm 11.96	
Duration of MCO, days, mean \pm SD	48.54 \pm 6.11	
Health quarantine, n (%)		
Yes	43	8.1
No	485	91.9
Gender, n (%)		
Male	200	37.9
Female	328	62.1
Ethnicity, n (%)		
Malay	217	41.1
Chinese	237	44.9
Indian	24	4.5
Others	50	9.5
Marital status, n (%)		
Single	261	49.4
Married	248	47.0
Widowed	8	1.5
Divorced/Separated	11	2.1
Religion, n (%)		
Muslim	233	44.1
Buddhist	158	29.9
Christian	96	18.2
Hindu	19	3.6
Others	3	0.6
No religion	18	3.4
Living zone, n (%)		
Red	397	75.2
Yellow	127	24.1
Green	4	0.8
Household income		
B40	226	42.8
M40	195	36.9
T20	107	20.3
Household size, mean \pm SD	4.26 \pm 2.12	
Employment status, n (%)		
Employed	327	61.9
Self-employed	66	12.5
Unemployed	135	25.6
Front-line workers, n (%)		
Yes	60	11.4
No	468	88.6

Education level, n (%)		
None at all	5	0.9
Secondary school	46	8.7
Tertiary	477	90.3
MCO = movement control order; SD = standard deviation		

Table 2

Demographic Characteristics of Individuals with and without Anxiety during the MCO for COVID-19 Pandemic

	Without anxiety (n = 374)	With anxiety (n = 154)	df	χ^2 , t, Z	p value
Age, y, mean \pm SD ^a	36.73 \pm 12.61	33.40 \pm 9.86	361.60	3.24	0.001*
Duration of MCO, days, mean \pm SD ^a	48.57 \pm 6.22	48.46 \pm 5.85	526	0.18	0.857
Health quarantine, n (%)					
Yes	32 (8.6)	11 (7.1)	1	0.29	0.589
No	342 (91.4)	143 (92.9)			
Gender, n (%)					
Male	151 (40.4)	49 (31.8)	1	3.39	0.065
Female	223 (59.6)	105 (68.2)			
Ethnicity, n (%)					
Non-Malay	217 (58.0)	94 (61.0)	1	0.41	0.522
Malay	157 (42.0)	60 (39.0)			
Marital status, n (%)					
Without partner	184 (49.2)	96 (62.3)	1	7.56	0.006*
With partner	190 (50.8)	58 (37.7)			
Religion, n (%)					
No religion	12 (3.2)	6 (3.9)	1	0.17	0.682
Have religion	362 (96.8)	147 (96.1)			
Living zone, n (%)					
Non-red	102 (27.3)	29 (18.8)	1	4.17	0.041*
Red	272 (72.7)	125 (81.2)			
Household income					
B40 and below	158 (42.2)	68 (44.2)	1	0.163	0.687
Above B40	216 (57.8)	86 (55.8)			
Household size, mean \pm SD ^a	4.24 \pm 2.11	4.30 \pm 2.15	525	-0.28	0.778
Employment status, n (%)					
Unemployed	99 (26.5)	36 (23.4)	1	0.55	0.459
Employed	275 (73.5)	118 (76.6)			
Front-line workers, n (%)					
Yes	49 (13.1)	11 (7.1)	1	3.85	0.050
No	325 (86.9)	143 (92.9)			
Education level, n (%)					
Up to secondary	39 (10.4)	12 (7.8)	1	0.87	0.351
Beyond secondary	335 (89.6)	142 (92.2)			
Approach, median (IQR) ^b	34 (13)	35 (8)		-1.93	0.054
Avoidant, median (IQR) ^b	20 (9)	25 (7)		-7.24	< 0.001*
Religion, median (IQR) ^b	6 (4)	6 (4)		-0.97	0.333
Humour, median (IQR) ^b	4 (3)	4 (3)		-0.33	0.744
Note. ^a Based on independent-samples t-test. ^b Based on Mann-Whitney U test.					
MCO = movement control order; SD = standard deviation; df = degree of freedom; χ^2 = chi-square test; t = t-test; Z = z-test. IQR = interquartile range; * = significant p-value					

Table 3

Logistic Regression: Factors associated with Anxiety during the MCO for COVID-19 Pandemic

Variable	B	95% CI	SE	Odds Ratio Exp(B)	P
Avoidant	0.11	1.08, 1.16	0.02	1.12	< 0.001*
Age	-0.09	0.97, 1.01	0.01	0.99	0.380
Marital status	-0.32	0.45, 1.17	0.24	0.73	0.190
Living zone	0.58	1.09, 2.92	0.25	1.78	< 0.001*

MCO = movement control order; CI=confidence interval, SE = standard error * = significant p-value

Table 4

Multiple Linear Regression: Factors Significantly Associated with Anxiety during the MCO for COVID-19 Pandemic

Variable	B	95% CI	SE	β	t	P
Avoidant coping	0.38	0.30, 0.46	0.04	0.37	9.03	< 0.001*
Living zone	1.28	0.16, 2.40	0.57	0.09	2.24	0.030*
Age	-0.02	-0.07, 0.03	0.03	-0.04	-0.79	0.429
Marital status	-0.819	-1.97, 0.33	0.58	-0.07	-1.40	0.161

MCO = movement control order; CI = confidence interval; SE = standard error; * = significant p-value

Table 5

Comparison between Individuals with and without Anxiety with Regards to the WHOQOL-BREF Domain Scores

The WHOQOL-BREF domains	The WHOQOL-BREF mean scores		Mean difference	Adjusted mean difference (95% CI)	p value
	Mean (SD)				
	With anxiety	Without anxiety			
Physical health	13.85 (2.59)	16.15 (2.21)	-2.30	-1.87 (-2.32, -1.42)	< 0.001*
Psychological	13.29 (2.95)	15.84 (2.44)	-2.55	-1.90 (-2.39, -1.41)	< 0.001*
Social relationships	12.88 (3.66)	15.03 (3.08)	-2.15	-1.59 (-2.22, -0.96)	< 0.001*
Environment	14.63 (2.31)	16.18 (2.20)	-1.55	-1.23 (-1.67, -0.79)	< 0.001*

Adjusted for age = 35.75, Avoidant = 22.08, zone = 0.75 and marital status = 0.47
MCO = movement control order; WHOQOL-BREF = World Health Organization Quality of Life Brief Version; SD = standard deviation; CI = confidence interval
* = significant p-value