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PSYCHOLOGICAL IMPACT OF QUARANTINE AND ISOLATION DURING COVID-19 OUTBREAK IN BRUNEI DARUSSALAM .

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ABSTRACT

Introduction: Quarantine is a public health measure commonly used to contain spread of an infectious disease; however, it can have significant psychological effects. **Methodology:** This cross-sectional study used a web-based self-administered questionnaire to assess the psychological impact of quarantine and isolation, and its association with demographic factors, quarantine/isolation circumstances, travel and medical history. DASS-42 assessment tool was used to measure for depression, anxiety and stress among individuals who underwent quarantine and isolation during the first wave of COVID-19 outbreak from 9 March until 6 May 2020 in Brunei Darussalam. **Results:** This study obtained 31% (544) response rate. 29.9% reported presence of psychological impact as a result of their quarantine. Based on bivariate and multivariate analyses, female, younger age group, longer quarantine/isolation duration, and pre-existing medical conditions experienced higher psychological effects (anxiety, depression and stress). Depression was significant in younger age individuals, unemployed/retired individuals, and those with pre-existing medical conditions, whilst anxiety was significant in individuals who had contact with a positive COVID-19 case. Pre-existing medical conditions had higher impact on depression (OR 3.82), anxiety (OR 3.26) and stress (OR 3.66). **Conclusion:** This study identified individuals at risk for developing depression, anxiety or stress during quarantine or self-isolation, and who would benefit from additional support and intervention to protect their mental health during this time.

Keywords: Quarantine, Psychological impact, COVID-19, Depression, Anxiety, Stress.

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ABSTRACT

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Keywords: Quarantine, Psychological impact, COVID-19, Depression, Anxiety, Stress.

INTRODUCTION

The World Health Organisation's (WHO) declaration of the SARS CoV-2 infection as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 prompted countries around the world to implement public health emergency preparedness and response measures. [1, 2] These measures included active surveillance of cases, early detection through COVID-19 testing, isolation of suspect and confirmed cases, thorough case management and contact tracing, and sharing of data with WHO. As of 27 April 2023, there has been a

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worldwide total of over 764 million confirmed cases of COVID-19, with 6.9 million cases of deaths (0.9%) caused by the infection. [3]

On 11 February 2020, the Ministry of Health, Brunei Darussalam developed a health and travel advisory for inbound and outbound travelers, using risk categorisation of countries based on evidence of country community transmission at the time. Countries were categorised into three: sustained community transmission, limited community transmission, or sustained local transmission. Inbound travelers from high risk countries were required to undergo 14 days of mandatory quarantine, whilst those from lower risk countries were required to complete 14 days of self-isolation and self-monitoring of symptoms. [4]

This study aimed to assess the prevalence of psychological problems specifically depression, anxiety, and stress, and their severity on individuals who were required to undergo quarantine and self-isolation as part of the nation's public health strategy during the first wave of COVID-19 outbreak in Brunei Darussalam. The objectives were to evaluate the association between demographic characteristics i.e. age, gender, nationality, type of employment, duration and facility of quarantine, recent travel history, contact with positive case, and underlying medical conditions, with depression, anxiety, and stress.

METHODOLOGY

This was a cross-sectional study that used a pre-designed and validated questionnaire to identify the presence of psychological problems and to assess the degree of severity of depression, anxiety and stress in individuals who had been issued a quarantine order (QO) or self-isolation notice (SIN) by the Ministry of Health (MOH) from 9 March until 6 May 2020. Based on the national list overseen by MOH, individuals aged 18 years and older who were issued QO or SIN from 9 March until 6 May 2020 were included in the study. This included individuals, particularly students returning from overseas studies or those who had been recalled back their sponsors due to the global escalation of the pandemic coupled with the unknown severity outcome of the infection at the time of early pandemic. Participants under 18 years were excluded from the study because of their minor status which would require parental consent for participation.

A web-based questionnaire in English and Malay language, including participant information sheet and consent form, were circulated to participants via a weblink, followed by a telephonic reminder for those who did not respond to the weblink survey form. Prior to circulation, the questionnaire was pre-tested on a small group of healthcare workers to evaluate for comprehensibility and ambiguity. Information including the demographic profile (age, gender, nationality, type of employment, recent travel history) were collected and DASS-42 scores were used to assess for depression, anxiety and stress. [5] DASS-42 uses a four-point Likert scale (mild, moderate, severe, extremely severe) that measures fourteen items reflecting negative emotional states for each of the subscales for depression, anxiety and stress. Scores of >9 for depression, >7 for anxiety, and >14 for stress, were taken to be symptomatic. [5]

Statistical Analyses

Data were analysed using SPSS version 25 (IBM Corporation, USA). Scores for depression, anxiety and stress were expressed as percentage. Pearson Chi-square and Fisher's Exact tests were used for comparison of symptom severity against demographic characteristics and other factors (recent travel history, contact with a positive case, quarantine or isolation facility, pre-existing medical conditions). Binary logistic regression was used to test for association between demo-

graphic and quarantine characteristics (predictors) with depression, anxiety and stress (outcome). A *p*-value of <0.05 was taken to be statistically significant.

Ethical Consideration

The study was granted ethics approval by the Medical and Health Research and Ethics Committee (Reference No: MHREC/MOH/2020/9).

RESULTS

A total of 2575 individuals were issued with either a QO or SIN during the two-month outbreak of the first wave. However, 1749 individuals met the study criteria. Of these, 544 responded to the questionnaire thus corresponding to 31% response rate.

The demographic profile of the participants (Table I) showed that the youngest respondent was aged 18 and the oldest was aged 73. Half of the respondents (50.3%) were in the 18-25 age group, followed by 26-35 age group (22.2%). The majority were female (56%) and Brunei citizens and permanent residents (88%). 233 (39%) were students, 51% were either employed or self-employed; 49% of participants were quarantined in a government designated facility such as hotels, 3.4% were isolated at the National Isolation Centre, and the rest were isolated in their own home (48%). The majority of participants (94%) had been issued QO for 8-14 days; whilst 41% had a recent travel history. 11% had pre-existing medical conditions including mental illness.

In this study, 163 participants (29.9%) reported the presence of psychological problems as a result of their quarantined or self-isolated state. 20.6% self-reported symptoms of depression, 19.3% for symptoms of anxiety, and 13.4% for symptoms of stress. For each of these sub-scales, a score of >9, >7, and >14, respectively, were taken to be symptomatic ranging from mild to extremely severe. Two thirds of the participants who reported the presence of depression, anxiety and stress in each subscale had mild to moderate symptoms only (Table II).

Table I: Characteristics of participants who underwent quarantine and self-isolation.

Characteristics	Mean (SD) [Range]	N (%) (n=544)
Age group (in years)		
18-25		274 (50.3)
26-35		121 (22.2)
36-45		73 (13.4)
46-55		47 (8.6)
56-65		23 (4.2)
>65		6 (1.1)
Mean age	30.33 (12.02) [18-73]	
Gender		
Male		239 (43.9)
Female		305 (56.0)
Nationality		
Bruneian		477 (87.6)
Malaysian		25 (4.5)
Indonesian		12 (2.2)
Filipino		8 (1.4)
Indian		8 (1.4)
British		4 (0.7)
Others		10 (1.8)
Type of employment		
Employed/Self-employed		275 (50.5)
Retired/Unemployed		269 (49.5)
Quarantine/Isolation facility		
Government designated location		266 (48.8)
Own home		259 (47.6)
NIC		19 (3.4)
Quarantine/Isolation duration		
0-7 days		31 (5.6)
8-14 days		513 (94.4)
Recent travel history		
Yes		222 (40.8)
No		322 (59.2)
Contact with positive case		
Yes		248 (45.5)
No		296 (54.5)
Pre-existing medical conditions		
Yes		60 (11.0)
No		484 (89.0)

NIC – National Isolation Centre

Table II: Prevalence of Depression, Anxiety and Stress by severity among quarantined and self-isolated.

Participants' sub-scale	N (%)
[a]**Depression (n=112)**	
Mild	33 (6.1)
Moderate	43 (7.9)
Severe	19 (3.5)
Extremely severe	17 (3.1)
[b]**Anxiety (n=105)**	
Mild	36 (6.6)
Moderate	33 (6.1)
Severe	17 (3.1)
Extremely severe	19 (3.5)
[c] **Stress (n=73)**	
Mild	23 (4.2)
Moderate	22 (4.0)
Severe	17 (3.1)
Extremely severe	11 (2.0)

[a] DASS-42 scores for Depression: Normal 0-9, Mild 10-13, Moderate 14-20, Severe 21-27, Extremely severe >28
[b] DASS-42 scores for Anxiety: Normal 0-7, Mild 8-9, Moderate 10-14, Severe 15-19, Extremely severe >20
[c] DASS-42 scores for Stress: Normal 0-14, Mild 15-18, Moderate 19-25, Severe 26-34, Extremely severe >34

Bivariate analysis showed there was association between psychological problems (depression, anxiety, and stress) and socio-demographic variables (Table III). Females were more likely to experience depression, anxiety and stress during quarantine or self-isolation (*p*-values for depression=0.001, anxiety=0.001, stress=0.01). A similar association was seen in those who had to undergo longer quarantine or isolation period (8-14 days) than those with a shorter period. Those who were isolated in the government designated isolation facilities and NIC reported significantly higher depressive symptoms (*p*=0.002). Unemployed or retired individuals self-reported depressive symptoms more than symptoms of anxiety or stress (*p*=0.000). A statistically significant association for depression and stress was observed for individuals who had a travel history compared to those who did not (*p*-values for depression=0.001, stress=0.004). Individuals who had contact with a COVID-19 positive case were more likely to experience anxiety than depressive or stress symptoms, when compared to those without a contact history (*p*-value for anxiety=0.008). Individuals with pre-existing medical conditions (*p* values for depression=0.003, anxiety <0.001, stress <0.001) and mental illness (*p* values for depression=0.02, anxiety=0.003, stress <0.001) were more likely to experience psychological symptoms during quarantine or isolation than those who did not.

Multivariate analysis showed that younger age and pre-existing medical conditions were significantly associated with depression, anxiety and stress (Table IV). Female local participants were significantly associated with anxiety; being unemployed or retired was significantly associated with depression; and contact with a COVID-19 positive case was significantly associated with stress. Having pre-existing medical conditions resulted in higher odds for depression (OR 3.82, CI: 2.0-7.3), anxiety (OR 3.26, CI: 1.8-6.0) and stress (OR 3.66, CI: 1.9-7.1).

DISCUSSION

This study showed that 29.9% of participants self-reported mild to extremely severe degrees of psychological symptoms in the form of depression, anxiety, or stress. Younger individuals (aged 35 years and below) and those with pre-existing medical conditions were more likely to self-report these symptoms.

A systematic review of the global burden of depressive and anxiety disorders in 204 countries found that females and younger age groups were more affected by major depressive and anxiety disorders during a pandemic. [6] The global prevalence of mental health issues among the general population during the COVID-19 pandemic was reported to be 28% for depression, 26.9% for anxiety, and 36.5% for stress. [7] In a Canadian cohort study, which was conducted for age related differences for measures of stress, anxiety and depression during the COVID-19 pan-

Table III: Bivariate analysis for association between characteristics and psychological symptoms (Depression, Anxiety, Stress) among quarantined and self-isolated participants.

Characteristic	Depression (>9), n=112 N (%)	*p*-value	Anxiety (>7), n=105 N (%)	*p*-value	Stress (>14), n=73 N (%)	*p*-value
Age (in years)						
≤35	98 (87.5)	***<0.001****	87 (82.9)	***0.008****	59 (80.8)	0.09
>35	14 (12.5)		18 (17.1)		14 (19.2)	
Gender						
Male	34 (30.4)	***0.001****	23 (21.9)	***<0.001****	22 (30.1)	***0.01****
Female	78 (69.6)		82 (78.1)		51 (69.9)	
Nationality						
Local	108 (96.4)	***0.001***	102 (97.1)	***0.001***	69 (94.5)	0.056
Non-local	4 (3.6)		03 (2.9)		04 (5.5)	
Employment Status						
Employed	32 (28.6)	***<0.001****	52 (49.5)	0.81	30 (41.1)	0.082
Retired/Unemployed	80 (71.4)		53 (50.5)		43 (58.9)	
Quarantine/Isolation facility						
Government designated location and NIC	76 (67.9)	***0002****	55 (52.4)	0.66	45 (61.6)	0.088
Own home	36 (32.1)		50 (47.6)		28 (38.4)	
Quarantine/Isolation duration						
0-7 days	0 (0.0)	***0.003***	0 (0.0)	***0.001***	0 (0.0)	***0.01***
8-14 days	112 (100)		105 (100)		73 (100)	
Recent travel history						
Yes	63 (56.3)	***0.001****	50 (47.6)	0.11	41 (56.2)	***0.004****
No	49 (43.7)		55 (52.4)		32 (43.8)	
Contact with positive case						
Yes	52 (46.4)	0.07	60 (57.1)	***0.008****	41 (56.2)	0.051
No	60 (53.6)		45 (42.9)		32 (43.8)	
Pre-existing medical conditions/1						
Yes	23 (20.5)	***0.003****	24 (22.9)	***<0.001****	18 (24.7)	***<0.001****
No	89 (79.5)		81 (77.1)		55 (75.3)	
Pre-existing medical conditions/2						
Mental illness#	09 (69.2)	***0.02***	11 (84.6)	***0.0003****	10 (76.9)	***<0.001****
Other	14 (29.8)		13 (27.7)		08 (17.0)	

*Pearson's Chi-square Test
**Fisher's Exact Test
#Mental illness = pre-existing Depression, Anxiety, or Stress

demic, it was found that the prevalence of moderate to high stress, generalised anxiety disorder and major depressive disorder were found to be 96%, 65%, and 66% respectively in those aged below 25 years. [8] These individuals were shown to spend more time on social media and therefore had more access to constant news and updates on COVID-19 pandemic, thereby being associated with increased levels of distress. [9] A similar conclusion was made by a study in Ireland whereby significant predictors of psychological impact were younger age, female gender, and history of mental illness. [5] A local study that had looked at the psychological impact of COVID-19 on doctors and dentists during the first wave COVID-19 pandemic in 2020 also found that younger age group and females appeared to be more vulnerable. [10]

This study showed that psychological symptoms were evident and statistically sig-

Table IV: Multivariate analysis of characteristics and psychological symptoms among quarantined and self-isolated participants.

Characteristic	Depression		Anxiety		Stress		Psychological impact#	
	OR (95% CI)	*p*	OR (95% CI)	*p*	OR (95% CI)	*p*	OR (95% CI)	*p*
Age	0.95 (0.90 – 0.98)	***0.006****	0.97 (0.94 – 0.99)	***0.045****	0.95 (0.92 – 0.99)	***0.03****	0.96 (0.94 – 0.98)	***0.004****
Gender (Female)	0.73 (0.44 – 1.22)	0.23	2.75 (1.57 – 4.84)	***<0.001****	1.4 (0.80 – 2.50)	0.23	2.07 (1.34 – 3.2)	***0.001****
Nationality (Local)	2.2 (0.72 – 6.72)	0.17	3.9 (1.14 – 13.8)	***0.03****	1.48 (0.47 – 4.7)	0.50	2.84 (1.13 – 7.1)	***0.026****
Employment (Unemployed/ Retired)	2.21 (1.10 – 4.44)	***0.02****	1.23 (0.62 – 2.43)	0.56	1.20 (0.54 – 2.68)	0.64	1.46 (0.83 – 2.58)	0.18
Quarantine facility (Govt/NIC)	1.14 (0.56 – 2.31)	0.7	1.04 (0.48 – 2.27)	0.91	1.13 (0.49 – 2.6)	0.77	1.12 (0.59 – 2.14)	0.73
Quarantine duration	0.99 (0.95 – 1.05)	0.91	1.02 (0.98 – 1.07)	0.32	1.03 (0.98 – 1.08)	0.31	1.03 (0.99 – 1.07)	0.13
Recent overseas travel	1.26 (0.71 – 2.25)	0.43	1.67 (0.90 – 3.1)	0.10	1.70 (0.84 – 3.4)	0.14	1.32 (0.79 – 2.2)	0.29
Contact with COVID -19 case	1.54 (0.87 – 2.71)	0.14	1.7 (0.97 – 2.9)	0.06	2.02 (1.94 – 3.92)	***0.03****	1.83 (1.13 – 2.97)	***0.015****
Pre-existing medical condition	3.82 (2.0 – 7.28)	***<0.001****	3.26 (1.78 – 5.96)	***<0.001****	3.66 (1.89 – 7.09)	<0.001*	3.06 (1.68 – 5.55)	***<0.001****

CI - Confidence Interval
** denotes statistically significant findings (p<0.05)*
 # Psychological impact = Depression and/or Anxiety and/or Stress

nificant in participants with a longer quarantine or isolation duration of more than 7 days, as well as in those with a travel history who were required to undergo immediate mandatory quarantine at a hotel or government designated facility. Quarantine is defined as the separation and restriction of movement of people who have potentially been exposed to a contagious disease to ascertain if they become unwell, thereby reducing the risk of them infecting others, whilst isolation is the separation of people who have been diagnosed with a contagious disease from people who are not sick. [11, 12] The two terms are often used interchangeably especially in communication with the public. In 2003, citywide quarantines were imposed in China and Canada during the outbreak of severe acute respiratory syndrome (SARS), and entire villages in many west African countries were quarantined during the Ebola outbreak in 2014. [13] Whilst the process of quarantine or isolation is often well-planned, the impact on the psychological well-being of the affected individual is often overlooked. Indeed, the objective of quarantine or isolation is to contain the spread of transmissible diseases; however, in the majority of cases, this may come at the expense of the individual's freedom which has been shown to take a considerable toll on mental health. Stressors during quarantine include long quarantine duration, fear of disease infection, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma. [14] Regular exercise or participation in physical activities, a balanced diet, adequate sleep, avoidance of alcohol and drugs, limiting access to social media that can heighten fear and anxiety, and contact with mental healthcare professionals for guidance or counseling, are methods that can reduce psychological adverse effects of quarantine. [15]

This is the first local community study in assessing the psychological effects and associated factors of quarantine and self-isolation measures in Brunei Darussalam during the first wave of COVID-19 pandemic. The limitations of this study are worth noting; firstly, this was a cross-sectional study design that looked at only 1-2 weeks of the partici-

pant's time in quarantine or isolation, and therefore cannot be used to evaluate whether such measures have long-term consequences on mental health. Secondly, the low response rate of 31% could have been improved if clinical interviews had been conducted to reach out to more participants who may not have easy access to digital technology through which this survey was conducted.

CONCLUSION

Females, younger age group, longer durations of quarantine or isolation, and individuals with pre-existing medical conditions (including mental illness) are at increased risk of experiencing psychological symptoms of depression, anxiety, and stress. Our study findings will be useful for the local health authority to identify groups of individuals in quarantine and isolation who may benefit from additional support such as provision of a clear rationale on the process and need for quarantine, accessibility to a mental health helpline and tele-psychological support.

DECLARATION OF CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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