The Maldives National Journal of Research
Vol. 9, No. 1, July 2021 pp. 89-100

Psychological stress imposed on residents of Malé city during the state-mandated lockdown

ANOOF ABDULLA, LATHEEFA HUSSAIN, AMINATH SAMHA, MARIYAM NAHAA NIZAM, MARIYAM NASMA IBRAHIM, AMINATH RAMIYA MOHAMED

The Maldives National University

ABSTRACT *The social isolation imposed by the COVID-19 pandemic brings out some worrying indicators about the public facing mental health issues and mostly, psychological stress, anxiety and depression. While the previous studies have suggested that pandemics impose a broad spectrum of psychological impacts, many people across the globe are currently facing the adverse effects of the COVID-19 pandemic, mainly because of the strict containment measures that are being enforced. People are being forced to stay indoors with heavy penalties if failed to abide by, and this has led to a very stressful and monotonous days. This paper shall address into reverberation of Maldivian government enforced curfew, lockdown and closure of public places including schools, colleges, universities and offices on the emergence of the first case of COVID-19 community transmission in Malé City on April 15, 2020 and until May 28, 2020. This paper shall also address the impact on psychological stressing of people living in the Malé City.*

Keywords: COVID-19, Psychology, Malé City, Lockdown

Originating as a cluster of unexplained etiology of pneumonia in Wuhan City of People's Republic of China, the Novel Coronavirus Disease, officially designated as Corona Virus Disease 2019 (COVID-19) by the World Health Organization (WHO), has managed to infect many people across the globe (Bo & Kraemar, 2020). Coronaviruses are named so due to the outer fringe of envelope protein spikes which resembles a crown ("corona" in Latin) and are a family of enveloped RNA viruses (Burrel et al., 2016). While these viruses are found to be pathogenic to mammals and birds, they cause mild upper respiratory tract infections in humans and can be transmitted in to larger human populations causing Severe Acute Respiratory Syndrome (SARS) and Middle-East Respiratory Syndrome (MERS) which are severe respiratory illnesses (Burrel et al., 2016).

The first confirmed Covid-19 case of local transmission was reported on April 15, 2020 (Nadiya et al., 2020). Since then, the total number of confirmed cases had increased drastically to 16,056 by February 1st, 2021 (Health Protection Agency, 2021). Hence to curtail the spread of the virus, stringent containment measures were enforced by the Government of Maldives. For the purpose of this study, the lockdown period is defined as the time period when the state enforced lockdowns were implemented in the Republic of Maldives from April 2020 to May 2020.

While it has been proven that during the severe acute respiratory syndrome (SARS) epidemic, many psychiatric symptoms were detected including post-

ISSN 2308-5959/20210731

traumatic stress symptoms (PTSS) or posttraumatic stress disorder (PTSD), anxiety and depression among patients with SARS-CoV-1 (Cheng et al., 2004) it is fair to say that there will be many psychological problems that will arise with the new SARS-CoV-2 (COVID-19). The findings of this study will contribute to the benefit of the society and community considering that pandemics can pose a threat to mental health of people (Mak et al., 2010; Mak et al., 2009). With these findings and other studies that have been done on psychiatric and psychological impacts of pandemics, it is wise to believe that there may be an imposed threat to mental wellbeing of the people with strict containment measures enforced by the government of Maldives. Identification of these threats is important to assisting and cater for the needs of the people so as to achieve a sound mental health status of the citizens. Additionally, this study will be helpful in identifying appropriate measures in tackling the surfacing of mental problems.

Pandemics vs Mental Health

Pandemics can pose a threat to mental health of people (Mak, et al., 2010; Mak, et al., 2009). Research studies conducted on COVID-19 have shown a consistently negative impact of COVID-19 on mental health with 16% - 18% participants showing different symptoms of anxiety and depression (Rajkumar, 2020). Another study conducted in the People's Republic of China among clinically stable patients of COVID-19 showed a 96.2% prevalence of significant post-traumatic stress symptoms (PTSS) out of which 49.8% of the respondents were referred to psycho-educational services (Bo et al., 2020). Hence, state-imposed quarantine and lockdown measures could lead to hysteria, anxiety, depression and distress which can be aggravated with other factors such as financial problems, family issues, and insufficient supply of essentials (Maunder et al., 2003).

In the last few decades, numerous research studies have been conducted to identify the psychological impact following public quarantine and lockdown measures which resulted from similar epidemics and pandemics. One of the best examples for this would be the severe acute respiratory syndrome, SARS (2003) epidemic and H1N1 Influenza or Swine flu epidemic. (2009). Several studies conducted on patients who were subjected to quarantine and social isolation have showed an increase in the prevalence of psychological distress symptoms (Mihashi et al., 2009). These include emotional disturbances (Yoon et al., 2016), depression, stress (DiGiovanni et al., 2004), low mood with irritability and insomnia (Lee et al., 2005), posttraumatic stress syndrome (Reynolds et al., 2008), anger (Marjanovic et al., 2007) and emotional exhaustion (Maunder et al., 2003).

Methodology

The data reported in this report was collected during the first enforced lockdown in the Maldives. The data was collected through an online questionnaire composed of 34 questions which were either multiple choice or short- answer questions and was developed using Google Forms. The questionnaire had three sections including demographic data, data on the impact of COVID-19 and questions from Depression, Anxiety and Stress Scale (DASS-21) (Lovibond & Lovibond, 1995; Wong et al., 2012). The quantitative cross-sectional study to determine the psychological impact of COVID-19 had a target population of people who resided in the Malé City from the 15th of April, 2020 till 28th of May, 2020, inclusive of

the people from all nationalities, ethnic groups and races. People younger than the age of 18 and the mentally unfit were not included. The target sample size for this study was 377; which was derived using Raosoft sample calculator set at 5% margin of error, 95% confidence level, population size of 153,905 (National Bureau of Statistics, 2014) and a response distribution of 50%. The data for this study was collected using social media platforms. Instagram, Facebook, Viber groups, WhatsApp, Telegram, Snapchat and Messenger was used for the distribution of study questionnaire among the people who were known to reside in Malé city during the lockdown period. In addition, friends and family members of the study team members helped in reaching out to a wide spectrum of people.

Analysis

The data was analyzed using Statistical Package for the Social Sciences (SPSS) statistics software version 23.0. Descriptive statistics were used to describe prevalences and summaries of the sample measures. Inferential statistics were used to test the hypotheses of the study. Chi-square test was used to test categorical variables (Liu, et al., 2020). Mann Whitney-U test was used to test the differences in DASS-21 scores among different groups of interest. Spearman's rank correlation was used to test the correlation between DASS-21 scores and the number of people living in the household during the lockdown period. Kruskal-Wallis test was used to test the association between DASS-21 score and monthly net income and changes in financial income during the lockdown period. Pearson correlation was used to investigate the correlation between DASS-21 score and age. Multivariate logistic regression was used to determine the factors associated with depression, anxiety and stress scores.

Results

The survey has gathered information on the responder's socio-demographic data, history with COVID-19 and the DASS-21 scale. The most represented age group was 18 to 22 years (48.42%) followed by 23 to 27 years (26.24%) and 28 to 32 years (11.76%). The least represented age group in the respondents are from age categories 48 to 52 years, 53 to 57 years, 58 to 62 years, 63 to 67 years and 68 to 72 years all with 0.45% in each age category.

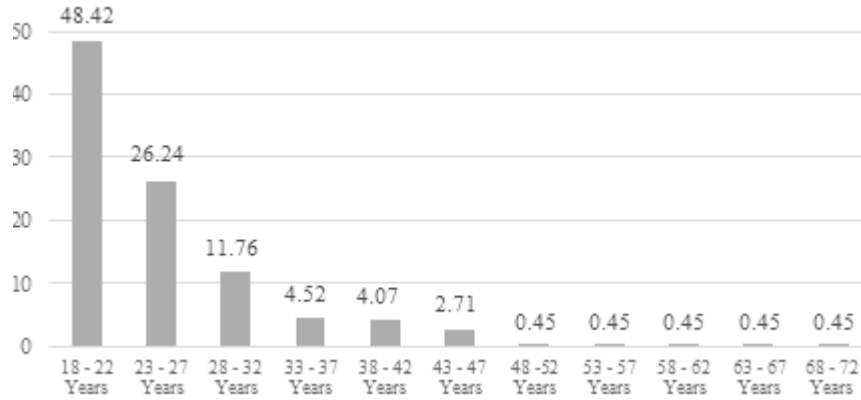

Figure 1. Distribution of age among defined categories

The mean age of the respondents of the survey was 25.3 years (SD ± 7.98) with a range of 18 years to 69 years. As for gender representation, there were more female participants (n=150, 67.87%) compared to male.

Most of the respondents of the survey were from the ward Machchangolhi of Malé city followed by Maafannu, Henveyru, Galolhu, Hulhulé and Villimalé. Figure 2 shows the percentage of respondents from each ward.

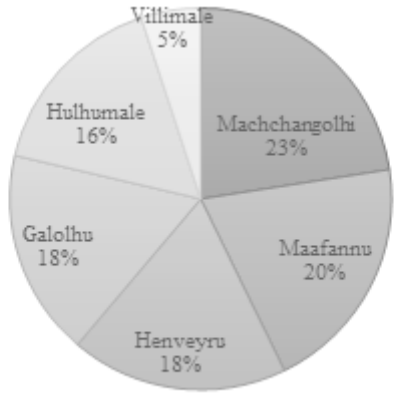

Figure2. Representation of respondents from their consecutive wards in Malé city

Regarding occupations, the survey has found that 41.9% (n=91) were employed while 3.2% (n=7) were self-employed and 43.8% (n=95) were students. It is noteworthy that 61.69% (n=124) people who were employed and earning stated that their income has drastically decreased as a direct impact of COVID-19. Figure 3 shows the percentage of employment status of the respondents of the study.

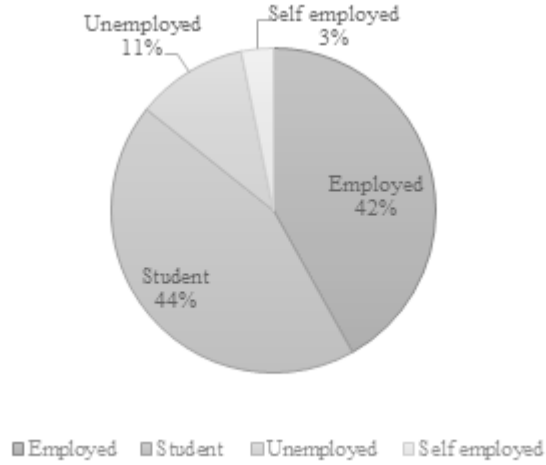

Figure 3. Percentile representation of employment status of the respondents

The distribution of monthly income was expressed such in that 33.6% (n=73)

had a monthly net income of less than MVR2,999 ($194.49) while 9.7% (n=21) respondents have reported to earn an amount of money between MVR3,000 ($194.55) to MVR4,999 ($324.19) and 31.8% (n=69) stated that they earned an amount within the range of MVR5000 ($324.25) to MVR 14,999 ($972.70). While 10.1% (n=22) have indicated earning an income in the range of MVR15,000 ($972.76) to MVR 29,999 ($1945.46), 1.9% (n=4) earns above MVR30,000 ($1945.53).

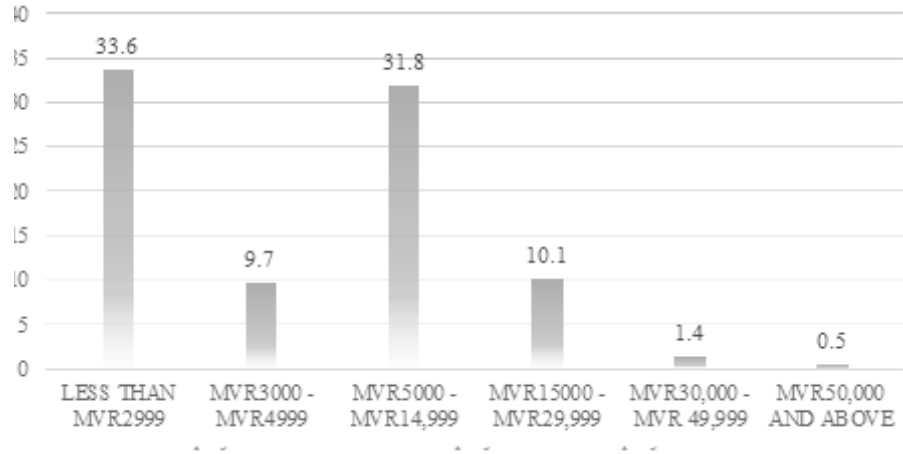

Figure 4. Percentile representation of the monthly net income of the respondents

Number of people living in a household is an important demographic factor that may correlate with the adverse effects of lockdown and quarantine measures for longer periods of time. And hence we asked all the respondents of the survey, the number of people in their household during the lockdown period. The number of people living in a household ranged from 1-20. In terms of marital status, 35.0% (n=76) were married while the majority of the respondents were single with a percentage of 60.8% (n=132) and, 4.1% (n=9) were divorced.

COVID-19 and its Impact

Participants were asked to indicate if they have ever tested positive for COVID-19 89.86% (n=195) respondents of the survey indicated that they have never been tested positive for the disease while 10.14% (n=22) respondents stated that they have tested positive for the disease during the lockdown period and was subjected to isolation. The respondents were also asked if they have ever been a direct contact of a positive case of COVID-19 and almost a quarter of the people (25.35%) (n=55) responded that they were quarantined for being a direct contact, while the remaining 74.65% (n=162) have denied to have ever been a direct contact of a positive case of COVID-19.

Participants were also asked if their financial income has affected with the onset of COVID-19 and results were such that 61.7% (n=124) respondents stated that their financial income decreased while 34.8% (n=70) respondents expressed that their financial income was not affected and remained same as usual. A minority of 3.5% (n=7) of participants stated that their financial income increased.

In the Republic of Maldives, with the onset of COVID-19 and its containment measures, the borders were subjected to closure and no tourists were to come in the island nation in which the economy of the country completely depends on its tourism sector. With this impact, there was a surge of termination of jobs, no pay leaves for employees and cutdown of wages for the government and civil service workers of the nation (Adam et al., 2020). And hence, the respondents were asked about their employment status and how it has affected during the COVID-19 period. While a majority of (80.53%, n=153) respondents expressed that they were not terminated from their jobs nor were subjected to no-pay leaves, 19.5% (n=37) expressed that they either lost their job or was subjected to no-pay leave from the companies.

Depression, Anxiety and Stress Variables

DASS-21 or depression, anxiety and stress scale (Lovibond & Lovibond, 1995) is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. Each of DASS scales contains 14 items divided into subscales of 2 to 5 items of similar content. The depression scale assessed dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/ involvement, anhedonia, and inertia. The stress scale assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable/over-reactive and impatient. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience with anxious affect (Psychology foundation of Australia, 2018).

Mean depression, anxiety and stress scores for the whole of the sample is depicted in the first column in Table 1 below.

Table 1
DASS-21 Mean Scores

Variable	Total cohort
n	217
Depression	7.27 ± 6.18
Anxiety	4.97 ± 4.54
Stress	6.94 ± 5.37

Depression, Anxiety and Stress Rates Versus Lockdown

The rates at which depression, anxiety and stress has impacted at scales of Normal, Mild, Moderate, Severe and Extremely severe symptoms are given in Table 2.

Table 2
A Summary of the Total Percentage of the Cohort Who Score Within the Cutoff Categories of DASS-21.

Total Cohort (n=217)				
Variable	DASS21 Classification	Range	Frequency	Percent
Depression	Normal	0 – 9	90	41.5%
	Mild	10 -13	29	13.4%
	Moderate	14 – 20	35	16.1%
	Severe	21 – 27	22	10.1%
	Extremely Severe	28+	41	18.9%
Anxiety	Normal	0 – 7	100	46.1%
	Mild	8 – 9	28	12.9%
	Moderate	10 – 14	32	14.7%
	Severe	15 – 19	21	9.7%
	Extremely Severe	20+	36	16.6%
Stress	Normal	0 – 14	117	53.9%
	Mild	15 – 18	36	16.6%
	Moderate	19 – 25	25	11.5%
	Severe	26 – 33	26	12.0%
	Extremely Severe	34+	13	6.0%

Monthly net income

An independent sample Kruskal-Wallis H test was done for depression, anxiety and stress scores and monthly net income.

For depression score, $x2(2) = 18.345$, $p = 0.003$. For anxiety and stress score the values were $x2(2) = 13.769$, $p = 0.017$ and $x2(2) = 12.623$, $p = 0.027$ respectively. Since all the p values were less than significance level (Alpha) we rejected the null hypothesis and accepted there was an association between depression, anxiety and stress score and different monthly net income during the lockdown period.

Changes in Financial Income

An independent sample Kruskal-Wallis H test was done for depression, anxiety and stress scores and changes in financial income during the lockdown period. For depression score, $x2(2) = 10.128$, $p = 0.006$. For anxiety and stress score the values were $x2(2) = 15.616$, $p = 0.00$ and $x2(2) = 17.097$, $p = 0.00$ respectively. Since all the p values were less than significance level (Alpha) we rejected the null hypothesis and accepted there was an association between depression, anxiety and stress score and likewise, no significant changes in financial income during the lockdown period.

Age

A spearman's rank-order correlation test was run to determine the relationship between age and depression, and stress and anxiety scores. The Spearman's correlation coefficient for depression score is -0.324, $p = 0.00$, rs = -0.214, $p = 0.001$ for anxiety score and rs= -2.226, $p = 0.001$ for stress scores. It is noteworthy to indicate that we got negative correlation coefficient (inverse correlation) for all the scores, which indicate that both the variables have an inverse relationship. Since the *p value* was less than 0.05, the null hypothesis was rejected and the alternative hypothesis was accepted which states that there was a significant correlation between age and DASS-21 scores.

Gender

The mean DASS-21 scores for females were higher compared with that of males. However, inferential statistics showed that depression and stress scores had a *p value* more than 0.05, hence, the null hypothesis was accepted which states that there was no significant relationship between gender and DASS-21 scores.

Discussion

This study utilized a cross-sectional online survey-based approach to investigate stress, anxiety and depression through various social media outlets available locally and commonly used by the general public. Furthermore, details of the measures utilized in the survey along with sociodemographic characteristics are also presented in detail. Considering the strong hit of the virus on the island nation of the Maldives, the need for such a study was extremely important. Several studies conducted in other countries during the pandemic also have shown to have an adverse impact on mental wellbeing of the general population of the country (Yoon et al., 2016; DiGiovanni et al., 200; Lee et al., 2005; Reynolds et al., 2008; Marjanovic et al., 2007; Maunder et al., 2003).

Conclusion

Baseline data of 217 respondents who shared their experiences of COVID-19 lockdown in Greater Male' area highlighted some financial, social and psychological problems. Our preliminary findings implies a comprehensive model which could integrate multiple independent factors of the psychological responses to this pandemic. We identified some modifiable risk factors which could be used to develop targeted interventions and support. Populations at risk that should be targeted include: people with low income and people whose salaries were deducted due to the economic impact of the pandemic. Employers should aim to reduce job insecurity and financial concern among employees to address the associated mental health consequences. There could be many factors which may have contributed to the increased psychological stress of women and people with younger age which need further analysis to reinforce appropriate interventions.

Recommendations

The Maldivian general public requires increased access to mental health services to meet the increase in COVID-19 related psychological problems identified in

this study. World Health Organisation (2000) has identified significant number of recommendations for problems similar to the findings of this study. These recommendations can result in better mental health outcomes of the public during and after the lockdown. These include:

- Create special policies on managing mental health and policies on supporting people with financial burden and people having job insecurities
- Access to evidence based psychological interventions to develop and maintain coping mechanisms
- Aware people about how to break the stigmatization and to reach out for help from the experts
- Employers should be mindful and try to minimize feelings of uncertainty by instilling hope in employees. Employers could also attempt to reduce financial concerns by allowing employees to continue to work even with reduced hours and income, to ensure employees do not lose their entire income (Wilson, et al., 2020).
- Other factors that may contribute to the changes seen in psychological impact among younger age people need to be investigated. Moreover, research needs to be done on how educational level, political views, having underage children, having a mental disorder and quality of family relationships could have an impact on psychological stress during the lockdown period

Acknowledgement

The data reported here are the work of students from the second batch of Maldives National University, School of Medicine. We would like to acknowledge the assistance we have received from Dr. Raheema Abdul Raheem and Dr. Shaistha Zubair, in completion of this study.

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