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PSYCHOLOGICAL IMPACT, STRESS, DEPRESSION, ANXIETY AND THEIR CORRELATES AMONG INDIVIDUALS INFECTED WITH COVID-19 IN TWO REGIONS IN CAMEROON

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ABSTRACT

Introduction: Cameroon is one of the countries hit by the Corona Virus (COVID-19) pandemic. While the current global focus is on preventing transmission, testing and finding an effective vaccine, the public are going through multiple psychological challenges in adjusting to the restrictive measures put in place by governments and in dealing with the disease. This study assessed the mental health impact of COVID-19 and associated factors among infected individuals in Cameroon. **Methods:** From July 10th to 9th August 2020, we conducted an online survey by sharing link to study questionnaire to potential study participants via text messages inviting eligible individuals to freely fill the study questionnaire. The survey data collected consisted of anonymous demographic characteristics, validated Depression, Anxiety and Stress Scales (DASS-21) and Impact of Event Scale-Revised (IES-R). Data was analyzed using SPSS version 25. **Results:** This study had a total of 270 participants. About 47% of respondents had mild to severe psychological impact, 55% reported mild to severe levels of anxiety, 63% had symptoms of depression and 65% admitted that they were stressed. Female gender, occupation of healthcare worker, age between 45 to 54 years and isolation out of home were significantly associated with poor mental health outcome. **Conclusion:** Stress, depression and anxiety are very common among individuals infected with COVID-19 in Cameroon. These psychological conditions are more common among infected women, healthcare workers, people aged 45 – 54 years and those isolated out of home. This study brings out the necessity to adopt a holistic approach, which includes mental health support for the management of patients infected with COVID-19 in Cameroon.

KEYWORDS: Psychological impact, COVID-19, Stress, Anxiety, Depression.

INTRODUCTION

Corona virus is a single stranded RNA virus that is classified under Corona viridae family and Nidovirales order. The name of the virus is derived from the crown-like spikes on its external surface.[1] Corona virus was a disease limited to animals[2] until 2003 when there was a recorded outbreak of Severe acute respiratory syndrome coronavirus, SARS-CoV in humans. There was another outbreak of Human corona virus HCoV NL63 in 2004, then HKU1 in 2005 and Middle East respiratory syndrome (MERS) in 2012.[3–5] Unlike the current COVID-19 outbreak which is a pandemic, these previous outbreaks were more or less limited to certain regions of the world.[1]

Since its inception in December 2019 in Wuhan city, China, COVID-19 has spread to almost all countries in the world. The World Health Organization (WHO)

declared COVID-19 a pandemic on the 11th March 2020.[6] Recent statistics show that there are over 22 million confirmed cases of COVID-19 worldwide and about 1 in every 5 infected person develop difficulty in breathing that requires hospital care. The crude mortality ratio due to COVID-19 is between 3-4%.[7–9] In Cameroon, there are over 18,700 confirmed cases and over 400 recorded deaths due to COVID-19.[10] National luck down, isolation of positive cases at special isolation facilities or at home, quarantine of exposed individuals/immigrants and public sensitization are some of the measures put in place by Cameroon government to curb the spread of COVID-19.

These restrictive measures imposed by the government and the unpredictable nature of the fast spreading pandemic is generating a myriad of psychological reactions across the public. All these psychological responses are natural reactions to randomly changing conditions according to WHO.[11,12] A Chinese study suggests that more than half of the participants had significant psychological Impact of the COVID-19 pandemic. Negative psychological effects in majority of study participants were also reported in recent studies carried out in the United States and Denmark.[13–16] Considering the fact that a study on psychological impact of COVID-19 have not been carried out in Cameroon, we therefore conducted this study to determine the various ways in which COVID-19 affected the mental health of individuals infected with COVID-19 in Cameroon and to understand the relationship between demographical data and psychological state of infected individuals. This may help policy makers in formulating comprehensive interventions.

MATERIALS AND METHODS

Study design, period and setting
This was a cross-sectional study conducted among individuals living in the North West (NW) and South West (SW) Regions of Cameroon who are currently infected with COVID-19 or who have recovered from the infection. Data was collected using an anonymous online survey platform (Google forms) from July 10th to 9th August 2020, given the need to evade physical contact with infected individuals, a link to the survey was distributed to potential respondents, via text messages.

Study population and sampling
The study population was made up of males and females, aged 21 years and above, residing in the NW and SW Regions of Cameroon who are currently infected with COVID-19 or who have recovered from the infection. We used consecutive sampling to recruit eligible participants who consented to the study. A target sample size of 297 was obtained using a sample size calculator.[17] Margin of error of ±5%, confidence level of 95%, a 50% response distribution, and a population of 1,295 people was used, based on most recent statistics on number COVID-19 infected individuals in the NW and

SW Regions of Cameroon.[10] In this study, we were able to obtain 270 participants.

Study procedures and Variables
Data was obtained using an online questionnaire, the link to the questionnaire was shared through text messages inviting individuals infected with COVID-19 and those who have recovered from the infection to freely take part in the study. Contacts of infected individuals were obtained after administrative and ethical clearances from COVID-19 test and treatment centers in the NW and SW Regions in Cameroon. An effort was made to capture healthcare workers who might have been exposed to corona virus while working in the field, healthcare workers belonging to the same social medial groups with the authors were encouraged to respond to survey if they receive the link sent through text message. The data collection tool was anonymous, it consisted of socio-demographic data, validated Impact of Event Scale-Revised (IES-R)[18] and the 21-item Depression, Anxiety and Stress Scale (DASS-21).[19]

Impact of Event scale–revised (IES-R). This tool comprised of 22-items self-report questionnaire which measure the effect of routine life stress, everyday traumas and acute stress. For all questions, the response format is a 5-point Likert scale ranging from 0 (not at all or hardly ever) to 4 (a great deal). Categorization of the total score ranges from 0–23 (normal), 24–32 (mild psychological impact), 33–36 (moderate psychological impact), and >37 (severe psychological impact).[13,18] The IES-R is made up of three subscales that assess the three main symptoms of Posttraumatic Stress Disorder (PTSD): The Intrusion subscale is mean score of items 1, 2, 3, 6, 9, 14, 16, 20. The Avoidance subscale is the mean score of items 5, 7, 8, 11, 12, 13, 17, 22. The Hyperarousal subscale is the mean score of items 4, 10, 15, 18, 19, 21. The internal consistency of the scores was acceptable for the three subscales (avoidance: $\alpha = 0.68$; intrusion: $\alpha = 0.71$; hyperarousal: $\alpha = 0.69$) and for the total scale ($\alpha = 0.74$).[20]

The DASS-21 is a 21-item self-report instrument for mental health assessment. It is made up of three 7-item subscales: depression (items 3, 5, 10, 13, 16, 17, 21), anxiety (items 2, 4, 7, 9, 15, 19, 20), and stress (1, 6, 8, 11, 12, 14, 18). Respondents indicate on a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time) the extent to which a symptom has been experienced over the past seven days. Scores for each subscale were assessed by adding the item responses and doubling the result up.[19] to make them comparable to similar COVID-19 study.[13] The subscales scores can be categorized into; for depression, normal (0–9), mild (10–12), moderate (13–20), severe (21–27), and extremely severe (28–42); for anxiety, normal (0–6), mild (7–9), moderate (10–14), severe (15–19), and extremely severe (20–42); and for stress, normal (0–10), mild (11–18), moderate (19–26), severe (27–34), and extremely severe

(35–42). The internal consistency of the scores was acceptable for the three subscales (depression: α = 0.79; anxiety: α = 0.76; stress: α = 0.81) and the general scale (α = 0.83).[20]

Data management and data analysis
Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive analyses were computed for the socio-demographic variables. Chi-square tests, independent samples t-tests and one-way analysis of variance (ANOVA) were utilized to determine the differences between groups for selected demographic variables. Bivariate associations between mental health variables (psychological impact, anxiety, stress and depression) and age (continuous variable) were assessed via Pearson's correlation coefficient *r*. Spearman's correlation coefficient ρ was used to test bivariate associations between mental health variables and ordinal variables. For the mental health variables, Normality of data was assessed using skewness and kurtosis tests. The statistical significance level was set at $p < 0.05$.

Ethical considerations
Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences of the University of Buea (approval number: 2020/1263/UB/SG/IRB/FHS). Participants also gave consent to willingly participate in the survey by clicking the 'Accept' button on the online survey form and were then directed to complete the questionnaire.

RESULTS

Psychological impact and mental health status of study participants
A total of 270 respondents consented to this study and completed the study questionnaire. The psychological impact of COVID-19 on infected individuals was measured using the IES-R scale. The mean IES-R score was 27.17 (SD = 24.01). Most (144, 53.33%) of the participants in this study reported minimal psychological impact (score < 23), 28 (10.37%) had mild psychological impact (score 24–32), 23 (8.52%) reported a moderate psychological impact (score 33-36) and 75 (27.78%) participants had symptoms of severe psychological impact (score > 37), see Table 1.

Table 1: Frequency, percentage distribution, means, standard deviation for Impact of event, stress, anxiety, and depression.

Scales and subscales	Categories	Frequency	Percentage
Revised Impact of event scale	Normal (0-23)	144	53.33
	Mild (24-32)	28	10.37
	Moderate (33-36)	23	8.52
	Severe (37+)	75	27.78
Depression	Normal (0-9)	99	36.67
	Mild (10-12)	39	14.44
	Moderate (13-20)	46	17.04
	Severe (21-27)	24	8.89
	Extremely severe (28+)	62	22.96
Anxiety	Normal (0-6)	61	22.59
	Mild (7-9)	81	30.00
	Moderate (10-14)	39	14.44
	Severe (15-19)	29	10.74
	Extremely severe (20+)	60	22.22
Stress	Normal (0-10)	94	34.81
	Mild (11-18)	77	28.52
	Moderate (19-26)	26	9.63
	Severe (27-34)	31	11.48
	Extremely severe (35+)	42	15.56
Revised Impact of event scale			
Subscales	**Item**	**Mean (SD)**	**Median**
intrusion	Q 1, 2, 3, 6, 9, 16, 20	9.68 (8.63)	6.00
Avoidance	Q 5, 7, 8, 11, 12, 13, 17, 22	9.82 (8.77)	6.00
Hyperarousal	Q 4, 10, 14, 15, 18, 19, 21	7.61 (6.97)	5.00
Depression, Anxiety, Stress Scale			
Subscales	**Item**	**Mean (SD)**	**Median**
Depression	Q 3, 5, 10, 13, 16, 17, and 21	13.39 (11.94)	10.00

| Anxiety | Q 2, 4, 7, 9, 15, 19, and 20 | 13.17 (11.29) | 8.00 |
| Stress | Q 1, 6, 8, 11, 12, 14, and 18 | 13.07 (12.12) | 10.00 |

The mental health status of study participants was evaluated using the DASS-21 scale. The overall DASS-21 mean score was 39.63 (SD = 34.64). When broken down into subscales (Table 1), the mean score for depression was 13.39 (SD = 11.94), 99 (36.67%) respondents were not depressed (score 0–9), 39 (14.44%) had mild depression (score 10–12), 46 (17.04%) were moderately depressed (score 13–20), 24 (8.89%) experienced severe depression (score 21–27) and 62 (22.96%) had extremely severe depression (score > 28). With regards to anxiety, the overall mean score was 13.17 (*SD* = 11.29). A total of 61 (22.59 %) respondents were considered to have normal levels of anxiety (score 0–6), 81 (30.00%) participants displayed mild levels of anxiety (score 7–9), 39 (14.44%) had moderate anxiety (score 10–14), 29 (10.74%) were severely anxious (score 15–19) and 60 (22.22%) manifested extremely severe levels of anxiety (score > 20). Concerning stress assessment, the mean total stress score was 13.07 (*SD* = 12.12). Most participants (94, 34.81%) had normal stress levels (score 0–10), mild stress was recorded in 77 (28.52%, score 11–18), 26 (9.63%) had moderate stress (score 19–26), 31 (11.48%) were severely stressed (score 27–34), and 42 (15.56%) experienced extremely severe stress (score >35) as a result of being infected with COVID-19 (Table 1).

The results displayed in Table 2 shows acceptable values of Skewness and Kurtosis analysis for Impact of event, stress, anxiety, and depression.[21]

Table 2; Means, standard deviations, Skewness and Kurtosis for Impact of event, stress, anxiety, and depression.

Scales and subscales	Mean	SD	Skewness		Kurtosis	
			Value	SE	Value	SE
Impact of event	27.17	24.01	1.26	0.15	0.18	0.30
Stress	13.07	12.12	1.17	0.15	0.14	0.30
Anxiety	13.17	11.29	1.14	0.15	0.08	0.30
Depression	13.39	11.94	1.06	0.15	-0.19	0.30

SD = Standard deviation, SE = Standard error

Demographic variables and psychological impact of COVID-19 infection as well as mental health status of infected individuals

Table 3 shows descriptive statistics for all demographic variables obtained in this study and the associations between demographic variables and psychological impact, stress, anxiety and depression. Females had significantly higher psychological impact as well as higher levels of depression, anxiety and stress compared to males. People aged 55 years and above had the least psychological impact, however this age group was also found to have higher levels of stress and anxiety compared to younger age groups. Individuals aged 45 to 54 years were the most depressed while people aged 55 years and over had the lowest levels of depression.

Overall, the young age group (18-24 years) were least psychologically affected by being infected with COVID-19. About half of the participants in this study were healthcare workers, despite their slightly smaller number, healthcare workers expressed significantly higher levels of psychological impact, they were also significantly more stressed and more anxious compared to non-healthcare workers. Higher levels of depression were also noted among healthcare workers but the difference was not statistically significant. About 24% of the study participants were isolated out of home, isolation out of home was associated with significantly higher psychological impact, alongside higher levels of depression, stress and anxiety among individuals infected with COVID-19.

Table 3: Association between demographic variables and the psychological impact of the COVID-19 pandemic as well as mental health status of infected individuals.

Variable	N (%)	Impact of event			Stress			Anxiety			Depression		
		Mean (SD)	t/F*	P	Mean (SD)	t/F*	P	Mean (SD)	t/F*	P	Mean (SD)	t/F*	P
Gender													
Male	159 (58.9)	25.17 (22.49)			11.81 (10.80)			12.25 (10.35)			12.49 (10.90)		
Female	111 (41.1)	30.03 (25.86)	9,24	0.00	14.88 (13.64)	14.46	0.00	14.49 (12.44)	9.83	0.00	14.67 (13.25)	10.84	0.00
Age group													
18-24	14 (5.2)	18.86 (22.40)			10.29 (10.46)			7.86 (11.02)			9.29 (10.57)		
25-44	139 (51.5)	25.57 (22.66)			11.37 (10.30)			12.71 (10.01)			12.10 (10.40)		

	N (%)	Mean (SD)			Mean (SD)			Mean (SD)			Mean (SD)		
45-54	107 (39.6)	31.25 (26.17)			8.00 (4.00)			7.60 (2.27)			16.02 (13.54)		
55+	10 (3.7)	17.30 (10.52)	2.40	0.07	16.13 (14.24)	4.16	0,00	14.99 (12.93)	2.91	0.04	8.80 (11.16)	3.40	0.02
Employment													
Healthcare worker	92 (34,1)	28.87 (26.39)			13.93 (13.79)			13.37 (12.60)			13.98 (13.02)		
Non-healthcare worker	178 (65.9)	26.29 (22.71)	5.76	0.03	12.63 (11.18)	8.90	0.00	13.07 (10.58)	5.48	0.02	13.08 (11.37)	3.52	0.09
Place of isolation													
At home	206 (76.3)	24.44 (23.01)			10.53 (10.38)			11.04 (9.64)			10.83 (10.14)		
Out of home	64 (23.7)	35.94 (25.21)	- 3.41	0.03	21.25 (13.68)	17.78	0.00	20.03 (13.37)	25.15	0.00	21.59 (13.60)	24.51	0.00

Differences in mean level between categories of dichotomous variables were assessed through t-test. For multiple category variables, one way ANOVAs were used. SD = Standard deviation,

DISCUSSION

Studies[5,13,22,23] have suggested that the COVID-19 pandemic have had a negative psychological effect on the general public, with limited data specific to the psychological effect on those infected with COVID-19. We conducted this study aimed at assessing the prevalence of depression, stress, anxiety and psychological impact of COVID-19 and the factors associated with poor mental health status among people infected with COVID-19 in Cameroon. This survey indicated that 47% of study participants had significant (mild, moderate and severe) psychological impact regarding COVID-19 infection. This is higher than the about 30% reported by Rodriguez-Rey and colleagues in Spain[23], the difference could be due to the fact that, unlike our study that was conducted only on people currently infected or have recovered from COVID-19 infection, the study by Rodriguez-Rey et al was conducted on the general public including individuals with relatively lesser impact due to the pandemic compared to those infected with the disease. However, Wang et al with a similar public study as Rodriguez-Rey reported higher levels (54%) of psychological impact compared to us, the difference could be due to the fact that, unlike Rodriguez-Rey and us, Wang and colleagues carried out their study during the initial phase of the COVID-19 pandemic during which COVID-19 restrictive measures put in place by governments were still very stringent and there was still much uncertainties with regards to the approach and effect of COVID-19 pandemic on the general public. Most (63%) of the participants in this study only had minimal to mild stress symptoms, this is similar to findings by Rodriguez-Rey and colleagues. Wang et al nevertheless had fewer (45%) participants in this category. Still concerning stress, our study indicated that 37% of COVID-infected patients in Cameroon had moderate to extremely severe stress, similar result was reported by a Spanish study.[23] Higher levels (26%) of moderate to severe depression were found in this study compared another in China.[13] The levels of anxiety (25%) found among COVID-19 infected patients in this study were similar to that of other studies[13,23] conducted among the general population.

Female gender was found to be associated with significantly worse psychological outcome among people infected with COVID-19, this is similar to findings by other western studies.[5,13,23] This is in line with previously available extensive epidemiological data which shows that women are at a higher risk mental health conditions.[24] In our survey, younger people (aged < 45 years) were less psychologically affected COVID-19 infection compared to older age groups, this is contrary to other European and Asian studies.[13,23] Knowing that they are less likely to die of COVID-19 infection[7] could be the reason for lesser psychological trauma experienced by the younger age groups. Similar to other studies, healthcare workers were found to be more vulnerable to unfavorable mental health outcomes. The reasons postulated for this were; feelings of vulnerability or loss of control and concerns about health of self, health of family and others, spread of the virus, changes in work and being isolated.[25,26] About 24% of study participants reported being isolated out of home, this group people were found to have significantly higher levels of stress, depression and anxiety compared to their counterparts that self-isolated at home. Isolation and quarantine especially out of home have be shown to be associated with poor mental health outcomes.[22,27,28] Other studies have reported varying levels of psychological distress due to COVID-19 on the general public, difference in sample size methodology may account for the variations in findings.

CONCLUSION

Our findings suggest that, individuals infected with COVID-19 in Cameroon suffer significant psychological distress. Female gender, healthcare workers, elderly people and isolation out of home were associated with worse mental health outcomes. Our survey is the first mental health related data on COVID-19 from

Cameroon. This paper has revealed the need for considering mental health issues by the policy makers while planning interventions to manage COVID-19 infected individuals.

STUDY LIMITATIONS

The design of this survey and sampling technique meant that only people with internet access who understands English could take part in the study. The consecutive sampling technique used in this study was successful to an extent but it had some downsides, there was oversampling of the middle age group with fewer participants aged 55 years and above as well as fewer people aged less 25 years. These two factors could have limited the number of survey participants and generalizability of the study. Another limitation of this study is the possibility of participants giving socially desirable answers.

Competing interests
The authors declare no competing interests

Author's contributions
All authors made substantial contributions to the conception and design, acquisition of data, or analysis and interpretation of data, took part in drafting the article or revising it critically for important intellectual content, gave final approval of the version to be published, and agreed to be accountable for all aspects of the work.

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