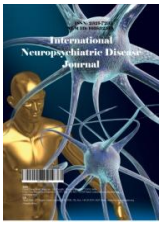

International Neuropsychiatric Disease Journal

14(3): 8-21, 2020; Article no.INDJ.60051
ISSN: 2321-7235, NLM ID: 101632319

Psychological Distress among Residents in Nigeria during the COVID-19 Pandemic

Chisom Adaobi Nri-Ezedi[1], Chioma Phyllis Nnamani[2], Nonye Ijeoma Ezeh[3], Chioma Okechukwu[4*], Oluwatoyin Fasesan[5] and Thomas Obiajulu Ulasi[1]

[1]Department of Paediatrics, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra, Nigeria.
[2]Department of Family Medicine, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State, Nigeria.
[3]Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria.
[4]Department of Paediatrics, River State University Teaching Hospital, Rivers State, Nigeria.
[5]Ben S Carson (Snr) School of Medicine, Babcock University, Ilishan-Remo, Ogun, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Author CAN designed the study and performed the statistical analysis. All authors were involved in active data gathering. Authors CPN and NIE contributed to the initial draft of the introduction, methodology and discussion. Authors CAN and CO managed the analyses of the study while authors OF and TOU edited and corrected the first draft of the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/INDJ/2020/v14i330129
Editor(s):
(1) Dr. Manabu Makinodan, Nara Medical University, Japan.
(2) Dr. Pasquale Striano, University of Genoa, Italy.
(3) Dr. Vincenzo La Bella, University of Palermo, Italy.
Reviewers:
(1) Hashem Shemshadi, University of Social Welfare and Rehabilitation Sciences, Iran.
(2) Sunita Singh, Banaras Hindu University, India.
(3) Masayo Uji, Yasuda Women's University, Japan.
Complete Peer review History: http://www.sdiarticle4.com/review-history/60051

Original Research Article

Received 25 July 2020
Accepted 29 August 2020
Published 26 September 2020

ABSTRACT

Background: During an epidemic, an associated rise in mental health concerns is usually observed. The impact of the ongoing COVID-19 pandemic and lockdown on mental health of adults residing in Nigeria is unknown. The current study attempts to determine the prevalence of psychological distress among adult residents in Nigeria and explore any potential risk factors.
Methodology: An online survey developed with Google form was distributed to willing respondents using social media platforms between the time period of 24th of April to 30th of May 2020. Kessler psychological distress scale was used to assess for prevalence of mental health morbidity.

**Corresponding author: E-mail: chiomaokechukwu412@gmail.com;*

Results: Overall, 815 adults responded to the survey, of which 344 (42.2%) were males and 471 (57.8%) females with a Male: Female ratio of 1:1.4. Overall, the top 3 sources of information on facts concerning COVID-19 were television (28.1%), WhatsApp (16.5%) and health care providers (14.3%), while the least source of information was the Nigerian Center for Disease Control (NCDC) (0.8%). 47.3% of the respondents had psychological distress: medium risk (41.4%) and high risk (5.9%). Significant predictors include age, occupation, income, working status, and perception of how likely the respondent believe that he or she can be infected with the disease.
Conclusion: A high prevalence of psychological distress was detected among adults living in Nigeria. This calls for an urgent review of the existing national protocol on the management of COVID-19 to include strategies and programs that will promptly detect and address the mental health needs of at-risk populations.

Keywords: COVID-19; coronavirus; pandemic; mental health; Nigeria; adults; psychological distress; stress; Kessler; social media; lockdown.

1. INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a highly infectious disease with severe impact on public health, including mental well-being [1]. This novel viral disease discovered in 2019 became a global health emergency in March 2020 [2]. High transmission and fatality rates associated with the virus led to unprecedented responses by governments around the world to contain the spread of the virus amongst its citizens [1]. At the time of writing, many countries, including the United States of America, France, Spain, Canada, United Kingdom and Nigeria have instituted state-imposed lockdown measures including the closure of the interstate borders; ban on domestic and international flights; ban on social gathering; and mandatory closure of schools, churches, non-essential commercial activities and industries [3]. Quarantine protocols were set up for confirmed cases while contacts and asymptomatic carriers were advised to self-isolate.

Multiple studies on past epidemics have consistently demonstrated a rise in the prevalence of mental co-morbidities [4–6]. In this current pandemic, factors that can trigger the onset of new and aggravation of existing mental health illnesses include the mandatory modification of behaviour that conforms to the restriction of all social gatherings and travel, and disruption of normal livelihood which can lead to loneliness, anxiety, depression, irritability and insomnia, harmful alcohol and drug use, self-harm or suicidal behaviour [1,3]. Furthermore, being quarantined is associated with acute stress and trauma-related disorders, particularly in specific at-risk populations such as the elderly, children, health workers and adults with co-morbidities [4,5]. A study on 1210 respondents in China during the pandemic found high rates of anxiety and depression in a third of the respondents [7]. The recent survey by the Indian Psychiatric Society reported a 20% increase in mental illness since the coronavirus outbreak in India [8]. Individuals confirmed to have COVID-19 also face social stigma and discrimination due to perceived fear of the populace towards the disease [9]. More disturbing is the current age of social media flooded with unverified information, rumors and misleading content particularly on COVID-19, that can further worsen the mental profile of users [7].

As of July 2020, over half a million people worldwide have died from COVID-19 related illnesses. In Nigeria, 744 deaths have so far been recorded [10,11]. Global efforts directed to mitigate the impact of this disease have largely focused on addressing its physical effects, while paying minimal attention to its impact on mental health. This disparity is even more profound in Nigeria with earlier reports before the pandemic demonstrated the poor growth and state of mental health services [12]. Thus, evaluating the burden of mental health disorders and associated factors is critical in understanding the crucial steps needed to address mental health demands associated with the pandemic. In the interim, the nation's current protocol on the management of COVID-19 needs to be reassessed to adopt measures that will provide psychosocial crisis interventions to at-risk members of the populace [8].

2. METHODOLOGY

2.1 Study Location

Nigeria is a country in West Africa with a population of approximately 202 million people. There are three major ethnic groups in Nigeria; Hausa, Igbo and Yoruba. Nigeria is made up of

36 autonomous states and the Federal Capital Territory. These states are located within six geo-political zones in Nigeria: North-Central, North-East, North-West, South-East, South-South and South-West. The proportion of the nationals below 15 years is 44% while the proportion above 60 years is 5%. The literacy rate for men and women respectively is 74.4% and 59.4%. Although, Nigeria is rich in natural resources with crude oil as its main export, the majority still live in poverty with a minimum monthly wage of N30,000 (approximately $80 dollars a month). According to the world bank, Nigeria is classified as a low-income country with a rise in unemployment as the core reason for elevated poverty levels, regional and gender inequalities, and socio-political unrest. Nevertheless, Nigeria has one of the fastest-growing telecommunications sectors in the world and the exponential growth of this sector has contributed to 10% of the nation's GDP in 2018 as compared to 1% in 2001 [13–15].

2.2 Study Design

A snowball sampling technique was relied upon in the distribution of the online questionnaires sent in form of a link through social media outlets such as whatsapp and emails. Ongoing lockdown measures and uncertainty in the mode of transmission of COVID-19 restricted the authors from physically meeting respondents who may not have access to gadgets with internet access or social media presence. States captured across the six geo-political zones include South-West: Lagos, Ekiti, Ibadan, Osun, Oyo, and Ondo; South-East: Abia, Anambra, Enugu, Imo; South-South: Akwa-Ibom, Bayelsa, Cross Rivers, Delta, and Rivers; North-Central: Abuja, Jos, and Kwara; North-West: Kaduna, Kano, Jigawa and Sokoto; and North-East: Adamawa and Borno

2.3 Study Participants

Residents in Nigeria aged 18 years and above with access to the internet and social media.

Inclusion criteria: Adults resident in Nigeria and aged 18 years and above who were willing to participate in the study.

Exclusion criteria: Respondents who declined consent.

2.4 Data Collection/Tools

An online survey was created using the free software Google form and distributed through social media networks (WhatsApp, Facebook, emails). Data were collected between the 24th of April and the 30th of May 2020 during the lockdown period in Nigeria.

The questionnaire had four sections; the informed consent, participants demographics, necessary information on Covid-19 and psychological distress assessment. The participants' demographics assessed include age, gender, state of residence and geographical zones, ethnicity, religion, marital status, education, occupation and income. The assessment of the participants' socioeconomic class was adapted from Oyedeji's social classification [16]. This was based on the participants' occupation and the highest level of education (Appendix 1).

Psychological distress was assessed using the Kessler (K10) Psychological distress scale [17]. The scale consists of 10 questions on non-specific psychological distress, which depicts to a degree the level of anxiety and depressive symptoms experienced in an individual in the past four weeks [17]. K10 is a simple, brief and valid instrument used by health professionals to detect the psychological distress. The response categories for each of the 10 items are: 1- all of the time, 2- most of the time, 3- some of the time, 4- a little of the time and 5- none of the time. These 10 items added together ranges from 10 to 50, where 30-50 indicates a high risk of anxiety or depressive disorder, 16-29 indicates a medium risk and 10-15 indicates low or no risk.

2.5 Statistical Analysis

Analysis was performed using Statistical Software Package SPSS version 22 (SPSS Inc. Chicago IL, USA) with graphical representation done with R software (version 3.6.3).

Descriptive statistics (including means and standard deviations) were calculated for the numerical variables. Categorical variables (socio-demographic, necessary information on Covid-19 and categorized Kessler scores) were summarized using frequencies and percentages. Binary logistic regression was used to assess the significant predictor variables. The test of statistical significance was set as p-value <0.05.

3. RESULTS

3.1 Socio-demographics of Respondents

Overall, there were 815 respondents, of which 344(42.2%) were males and 471(57.8%) females

with a Male: Female ratio of 1:1.4. Majority of the subjects were from the Igbo tribe (53.5%), and almost all the respondents were Christians (94.6%). The mean age of respondents was 35±7years. 499 (61.2%) of the respondents were currently working during the time of study while 431 (52.9%) of all the respondents had a monthly income of between N100,00-N500,000. Majority of the respondents belonged to the upper socioeconomic class, (Table 1).

3.2 Source of Information on COVID-19

Overall, the top 3 sources of information on facts concerning COVID-19 were television (28.1%), Whatsapp (16.5%) and health care providers (14.3%), while the least source of information was the Nigerian Center for Disease Control (NCDC) (0.8%). (Table 2). A similar distribution was observed across all six geo-political zones.

3.3 Associated Risk Factors of Mental Disorder

Overall, almost half of the respondents (47.0%) had psychological distress (medium risk-41.2%, high risk-5.8%). The common perception as to the virulence of COVID-19 was high (mean score of 8.6+ 1.8) with respondents in the South-West region of Nigeria having the highest perception of its severity (9.0 + 1.4)). (Table 1)

Regarding the perception of risk of having the disease, overall, the respondents had a low perception of risk (3.8 + 2.8), with the least being among respondents in the North-east (2.3 + 2.4). (Table 1)

A bivariate correlation analysis demonstrated a significant positive relationship between perception of COVID-19 severity and the likelihood of contracting the disease in females (r = +0.132, p=0.005) (Fig. 1)

Significant predictors of psychological distress using a univariate logistic regression model with mental outcome stratified into dichotomous values (no/low risk vs medium/high risk) include age, occupation, income, working status, and the respondents' perceived risk of contracting the disease. Non-significant predictors include marital status, education, and source of information on COVID-19. Using the multinomial logistic regression model, significant predictors include perception of the degree of infectivity of the virus and marginally age of the respondents. (Table 4)

4. DISCUSSION

This study was conceptualized to determine the prevalence and predictors of psychological distress among adults residing in Nigeria during the ongoing COVID-19 pandemic. Overall, we found that almost half of the respondents (47.3%) had some form of psychological distress. This alarming proportion is in contrast to past prevalence rates of mental disorders reported in community-based studies conducted before the current pandemic [18–20]. The high rate of abnormal mental profile observed in this study may allude to the ongoing global pandemic, considered by the academic community to be a traumatic event and a disaster with devastating physical, mental and socioeconomic effects. Factors associated with the pandemic in previous studies that can aggravate mental health include a modified social behaviour conforming to social distancing, self-isolation, lockdown and ban on interstate travel; global economic recession due to loss of jobs; restriction of social gatherings in church, sports arena and entertainment venues; and the rising gamut of misinformation propagated in the social media by self-declared experts and conspiracy theorists. To mitigate the growing prevalence of mental disorders, governments and authorized health organizations must recognize this evolving threat to our mental health and institute a broad-based public education and awareness alongside with provision of mental health services.

Age was a significant predictor of psychological distress. Interestingly, we observed that older respondents were less likely to have anxiety and depression compared to the younger respondents. This finding is similar to the report of a nationwide survey in China, where an increased risk of mental disorder was observed among respondents that are young adults and above 60 years [21]. The average age of the participants in our study was 35 years old, with 0.7% of the respondents above 60 years of age. Majority of our participants were within the middle age group. In Nigeria, this age group is more likely to be the working class, with young families to cater and provide for their needs. This age group also have more access to social media. Thus, one can

agree that this group are more at risk of psychological distress due to the negative economic impact associated with the pandemic that has led to the loss of jobs, decreased earning power and ultimately an increased burden to provide for the family. The report from the nationwide study in China also showed that increased social media use was associated with a higher degree of vulnerability and a sense of helplessness in younger respondents. In Italy, the older age group were more likely to be at risk of mental disorders which is not surprising as deaths from COVID-19 disproportionately affects adults above 60 years of age [2].

The female respondents had increased odds of being at risk of developing mental disorders compared to the men. It is widely acknowledged that following traumatic events, women are more susceptible to physical and psychological distress, particularly anxiety and depression. Reasons cited for this predilection include the burden of looking after a family, reduced earning power, victims of social, cultural and religious dogma, and victims of domestic violence which may have worsened during this pandemic. Similar findings were also observed in Italy where women were more likely to develop post-traumatic stress syndrome, depression, anxiety, and insomnia compared to men [2]. It is therefore not surprising that we found among the female respondents a significant positive relationship between the perception of COVID-19 severity and how likely they think that they can be infected with the virus (r=+0.132, P=0.005). Remarkably, in men, an opposite effect was observed (r=-0.186, p=0.116), independent of the different socioeconomic backgrounds and indicative of a better mental and emotional profile in this gender.

Overall, being married appeared to offer some benefit against psychological distress with the greatest benefit observed in married respondents who are living with their spouses. In contrast, being single, separated, or divorced was associated with an increased risk of psychological disorder. Marriage recognized as a formal union between two individuals with a common goal can indeed protect against the onset of mental distress by combating associated co-morbidities such as loneliness, boredom, anxiety amongst others. Again, overall, married respondents with children had a decreased risk of abnormal mental profile. However, respondents with children in the adolescent age range had increased odds of developing psychological distress which may be associated with the increased sense of independence among children in this age group. This can lead to a heightened degree of distress and anxiety in parents who often times experience a lack of control over their children in this critical stage of development.

Most (28.1%) of the participants got their source of information about COVID- 19 from Television. In contrast, the least source of information was from Nigeria Center for Disease Control (NCDC) (0.8%), which is the official government website for disseminating information related to COVID-19. Although not significant, an increased odds of mental health disorder was observed among respondents who used the various forms of social media compared to the television. This observation is certainly not surprising as emerging reports have demonstrated an alarming degree of proliferation of both fabricated and falsified reports regarding the epidemiology, transmission, prevention and management of COVID-19 which can trigger mental health issues by causing panic and paranoia amongst other co-morbidities [22,23] To curb this disturbing trend, media industries have instigated measures that can detect and deter the further spread of unverified reports on COVID-19 [24]. Furthermore, individual measures aimed at avoiding excessive sharing and exposure to unverified posts of COVID-19 can help in mitigating the negative mental effects. NCDC, designated as the nation's authorized medium on facts concerning COVID-19 was observed to be the least used medium for the source of information by respondents. The reason for this remains unknown. However, it can be adduced that its unpopularity may stem from the NCDC opted means of dissemination of information via short message service (SMS) and twitter, both of which are not popular among the average Nigerian. Thus, NCDC may need to reconsider the use of other effective platforms to ensure that the public is well informed through periodic updates of information concerning COVID-19, including addressing the mental needs of the populace.

Table 1. Socio-demographic characteristics and prevalence of psychological distress among respondents

	Total	South West	South East	South South	North Central	North West	North East
	***n*/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**
n	815 (100)	215 (26.4)	141 (17.3)	295 (36.2)	130 (15.9)	27 (3.3)	7(0.9)
Age	35 (7.2)	33.5 (7.6)	33.7 (9.1)	35.2 (7.6)	32.3 (6.2)	32.6 (7.2)	34.4 (13.9)
Gender							
Women	471 (57.8)	125 (58.3)	83 (59.0)	169 (57.4)	74 (57.3)	15 (53.8)	5 (66.7)
Men	344(42.2)	90 (41.7)	58 (41.0)	126 (42.6)	56 (42.7)	12 (46.2)	2 (33.3)
Ethnicity							
Igbo	438 (53.5)	76 (35.3)	140 (99.3)	147 (49.8)	64 (49.1)	8 (26.9)	3 (42.9)
Yoruba	158 (20.2)	123 (57.4)	-	17 (5.9)	16 (12.0)	1 (3.8)	1 (14.3)
Hausa	17 (2.5)	1 (0.5)	-	-	6 (4.6)	8 (30.8)	2 (28.5)
Other tribes	202 (23.8)	15 (6.8)	1 (0.7)	131 (44.3)	44 (34.3)	10 (38.5)	1 (14.3)
Religion							
Anglican	123 (15.2)	35 (16.2)	35 (24.8)	38 (12.8)	13 (10.0)	-	2 (33.3)
Catholic	246 (29.9)	43 (20.2)	71 (50.4)	85 (28.9)	41 (31.6)	6 (23.1)	-
Pentecostal	405 (49.5)	117 (54.5)	35 (24.8)	170 (57.6)	64 (49.2)	15 (53.8)	4 (50.0)
Islam	41 (5.4)	20 (9.1)	-	2 (0.7)	12 (9.2)	6 (23.1)	1 (16.7)
Marital Status							
Single	334 (40.2)	98 (45.6)	54 (38.5)	94 (31.8)	69 (52.9)	15 (53.9)	4 (57.1)
Married*	393 (49.1)	96 (44.3)	68 (48.2)	166 (56.3)	49 (37.4)	11 (42.3)	3 (42.9)
Married**	68 (8.2)	11 (5.3)	17 (11.9)	31 (10.4)	8 (6.5)	1 (3.8)	-
Separated	7 (0.9)	4 (1.9)	1 (0.7)	1 (0.4)	1(0.8)	-	-
Divorced	6 (0.7)	5 (2.4)	-	1 (0.4)		-	-
Widowed	7 (0.9)	1 (0.5)	1 (0.7)	2 (0.7)	3 (2.4)	-	-
No of children	2.3 (1.2)	2.4 (0.8)	2.9 (1.4)	2.5 (1.1)	2.6 (1.4)	2.3 (1.8)	3.3 (2.3)
Age Category of children (years)[£]							
Infants	75 (10.5)	21 (12.0)	15 (12.9)	25 (8.9)	9 (11.5)	2 (9.5)	-
1-5	275 (38.5)	61 (34.9)	47 (40.5)	115 (41.1)	30 (38.5)	10 (47.6)	1(16.7)
6-10	216 (30.2)	53 (30.3)	29 (25.0)	89 (31.8)	25 (32.1)	5 (23.8)	3 (50.0)
11-17	100 (14.0)	28 (16.0)	15 (12.9)	38 (13.6)	8 (10.3)	3 (14.3)	1 (16.7)
Above 18	49 (6.9)	12 (6.9)	10 (8.6)	13 (4.6)	6 (7.7)	1 (4.8)	1 (16.7)

	Total	South West	South East	South South	North Central	North West	North East
	n/SD (%)	n/SD (%)	n/SD (%)	n/SD (%)	n/SD (%)	n/SD (%)	n/SD (%)
Occupation[¶]							
Score 1	525 (64.5)	122 (56.4)	85 (60.1)	226 (76.5)	79 (60.6)	8 (30.8)	5 (71.4)
Score 2	120 (14.7)	39 (18.3)	21 (14.6)	29 (9.8)	23 (17.6)	8 (30.8)	-
Score 3	41 (5.0)	15 (7.1)	2 (1.5)	15 (5.1)	6 (5.0)	3 (11.5)	-
Score 4	14 (1.7)	5 (2.5)	2 (1.5)	4 (1.4)	1 (0.8)	2 (7.7)	-
Score 5	115 (14.1)	34 (15.7)	31 (22.3)	21 (7.2)	21 (16.0)	6 (19.2)	2 (28.6)
Education[¶]							
Score 1	764 (93.7)	191 (88.8)	127 (90.2)	286 (96.8)	126 (96.8)	27 (100)	7 (100)
Score 2	22 (2.7)	9 (4.4)	4 (3.0)	6 (2.1)	3 (2.4)	-	-
Score 3	29 (3.6)	15 (6.8)	10 (6.8)	3 (1.1)	1 (0.8)	-	-
Score 4	-	-	-	-	-	-	-
Score 5		-	-	-	-	-	-
Currently working?							
No	316 (38.8)	106 (49.5)	64 (45.2)	75 (25.5)	58 (44.4)	12 (46.2)	1 (14.3)
Yes	499 (61.2)	109 (50.5)	77 (54.8)	220 (74.5)	72 (55.6)	15 (53.8)	6 (85.7)
Income[¥]							
Above 500k	149 (18.3)	44 (20.4)	18 (12.5)	75 (25.3)	11 (8.3)	-	1 (14.3)
100k-500k	431 (52.9)	98 (45.8)	77 (54.7)	155 (52.7)	84 (64.5)	14 (52.0)	3 (42.9)
50k-100k	119 (14.6)	40 (18.4)	15 (10.9)	37 (12.5)	21 (16.5)	4 (16.0)	2 (28.6)
20k-50k	81 (9.9)	27 (12.4)	19 (13.3)	16 (5.5)	11 (8.3)	8 (28.0)	-
<20k	35 (4.3)	6 (3.0)	12 (8.6)	12 (4.0)	3 (2.4)	1 (4.0)	1 (14.3)
Perception of COVID-19 severity	8.6 (1.8)	9.0 (1.4)	8.5 (1.8)	8.3 (2.1)	8.8 (1.7)	8.8 (1.8)	8.0 (1.8)
Perception of COVID-19 infectivity	3.8 (2.8)	3.5 (2.7)	3.4 (2.6)	4.1 (2.8)	4.0 (2.8)	3.5 (3.0)	2.3 (2.4)
Rate of Psychological Distress							
Low/No Risk	432 (53.0)	115 (53.5)	74 (53.0)	161 (54.7)	64 (49.2)	13 (48.0)	5 (71.4)
Medium Risk	336 (41.2)	90 (42.0)	57 (40.2)	122 (41.3)	55 (42.6)	10 (36.0)	2 (28.6)
High Risk	47 (5.8)	10 (4.5)	10 (6.8)	12 (4.0)	11 (8.2)	4 (16.0)	-

**Living with spouse, **Not living with spouse, [£]Multi-responses collated, [¶]Further details on the different scores of occupation and education are available in the methodology section. [¥]k in income represents thousands of naira*

Table 2. Multiple responses on sources of information concerning COVID-19

	Total	South West	South East	South South	North Central	North West	North East
	***n*/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**	**n/SD (%)**
Sources of information							
Television	591 (28.1)	152 (30.2)	95 (28.9)	206 (28.3)	94 (31.4)	21 (30.4)	4 (33.3)
Whatsapp	236 (11.2)	67 (13.3)	38 (11.6)	81 (11.1)	34 (11.4)	7 (10.1)	-
Health Worker[¶]	212 (10.1)	50 (9.9)	32 (9.7)	82 (11.3)	30 (10.0)	9 (13.0)	-
Radio	348(16.5)	91 (18.1)	61 (18.5)	114 (15.7)	52 (17.4)	9 (13.0)	2 (16.7)
Social Media*	301(14.3)	71 (14.1)	46 (14.0)	109 (15.0)	46 (15.4)	13 (18.8)	3 (25.0)
Family	135 (6.4)	27 (5.4)	20 (6.1)	59 (8.1)	17 (5.7)	4 (5.8)	1 (8.3)
NCDC	17 (0.8)	2 (0.4)	4 (1.2)	6 (0.8)	5 (1.7)	-	-
Friends	130 (6.2)	31 (6.3)	20 (6.1)	51 (7.0)	15 (5.0)	6 (8.7)	1 (8.3)
CHW	53 (2.7)	13 (2.6)	13 (4.0)	19 (2.6)	6 (2.0)	-	1 (8.3)

*[¶]Heath workers in federal, state and private institutions, *Social media not including whatsapp, NCDC- Nigeria Centre for Disease Control, CHW- Community Health Workers*

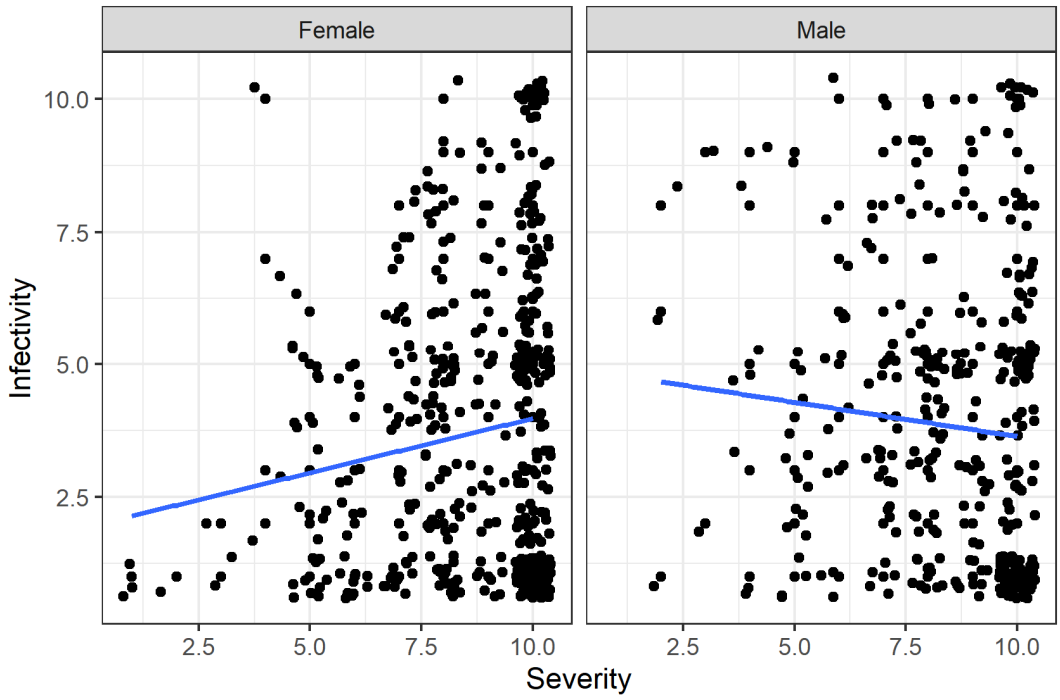

Fig. 1. Perception of the degree of severity and infectivity of COVID-19 among male and female respondents (Female: r = +0.132, p=0.005; Male: r = -0.086, p=0.116)

Table 3. Predictors of psychological distress in a univariate binary logistic regression model which dichotomizes risk of mental distress as being either present or absent

Predictors	Odds ratio	95% CI	p value
Age	0.972	0.953-0.991	0.005***
Gender			
Female (ref)			
Male	0.770	0.579-1.024	0.072
Geo-political zone			
South-West (ref)			
South-East	1.019	0.656-1.583	0.933
South-South	0.952	0.661-1.372	0.794
North-Central	1.189	0.757-1.866	0.452
North-West	1.246	0.542-2.865	0.604
North-East	0.460	0.087-2.428	0.360
Ethnicity			
Igbo (ref)			
Yoruba	0.913	0.626-1.330	0.634
Hausa	0.790	0.288-2.163	0.646
Religion			
Anglican(ref)			
Catholic	1.100	0.701-1.725	0.679
Pentecostal	0.754	0.495-1.149	0.188
Islam	0.655	0.315-1.362	0.257
Marital Status			
Single (ref)			
Married[§]	0.754	0.559-1.018	0.065

Predictors	Odds ratio	95% CI	p value
Married[£]	1.406	0.817-2.420	0.219
Separated	1.368	0.301-6.211	0.685
Divorced	5.129	0.592-44.403	0.138
Widowed	1.368	0.301-6.211	0.685
Have Children			
No(ref)			
Yes	0.888	0.669-1.177	0.408
No of Children	0.979	0.895-1.070	0.636
Age Category of children (years)			
Under 5s (ref)			
5-10	0.926	0.650-1.319	0.669
11-17	1.026	0.650-1.619	0.912
Above 18	0.627	0.330-1.189	0.152
Occupation[¶]			
Score 1 (ref)			
Score 2	1.098	0.728-1.656	0.655
Score 3	2.061	1.056-4.025	0.034**
Score 4	3.543	1.113-11.281	0.032**
Score 5	1.689	1.102-2.589	0.016*
Education[¶]			
Score 1 (ref)			
Score 2	1.247	0.543-2.862	0.603
Score 3	1.333	0.6082.922	0.472
Score 4	-	-	-
Score 5	-	-	-
Currently working?			
No (ref)			
Yes	0.693	0.520-0.923	0.012**
Income			
Above 500k (ref)			
100k-500k	1.120	0.759-1.653	0.569
50k-100k	1.467	0.885-2.432	0.137
20k-50k	2.309	1.312-4.064	0.004***
<20k	2.066	0.946-4.514	0.069
Sources of Information[¥]			
Television (ref)			
Radio	1.128	0.832-1.529	0.439
Social Media	1.251	0.910-1.720	0.169
Whatsapp	1.144	0.875-1.496	0.327
Health Workers	1.126	0.850-1.492	0.407
Family	1.344	0.922-1.959	0.124
Friends	1.290	0.880-1.891	0.192
Community Health Workers	0.958	0.544-1.685	0.881
NCDC	0.579	0.195-1.714	0.323
Perception of COVID-19 severity	1.055	0.977-1.139	0.175
Perception of COVID-19 infectivity	1.095	1.040-1.153	0.001***

*Dichotomous values of psychological distress (No/Low risk=0, Medium/Severe risk=1) was used in the design of this model. ref: reference ** 0.05, *** <0.001 (significant), [§] married couple living with spouse, [£] married couple not living with spouse, k: thousands, [¶] Different score in occupation and education defined in the methodology section. [¥] Heath workers in federal, state and private institutions, Social media not including whatsapp, NCDC- Nigeria Centre for Disease Control, CHW- Community Health Workers*

Table 4. Predictors of psychological distress in a multivariate binary logistic regression model

Predictor	Odds ratio	95% CI	p value
Age	0.979	0.959-1.000	0.053
Occupation¶			
Score 1 (ref)			
Score 2	0.995	0.625-1.584	0.981
Score 3	1.517	0.694-3-313	0.296
Score 4	2.150	0.613-7.541	0.232
Score 5	0.909	0.498-1.660	0.756
Currently working?			
No (ref)			
Yes	0.785	0.524-1.176	0.240
Income			
Above 500k (ref)			
100k-500k	0.926	0.608-1.410	0.720
50k-100k	1.381	0.774-2.463	0.275
20k-50k	1.635	0.845-3.163	0.144
<20k	1.678	0.657-4.286	0.280
Perception of COVID-19 infectivity	1.283	1.053-1.187	0.000**

***significant, ¶Different scores in occupation defined further in methodology. k in thousands of naira*

Although the common perception of the likelihood of being infected with the virus was low (3.8; using a 10-point scale), overall, it was the strongest predictor of psychological distress in our study. Respondents who believed that they are at increased risk of being infected with the virus, independent of all other associated predictors, had significantly higher odds of developing psychological distress. Our finding is similar to the work conducted in India where about a third of the participants reported having abnormal social behavior due to the fear of contracting the virus [25]. Emotion can be a powerful mental construct with fear of contracting the disease, fear of the unknown, and fear of lack of effective treatment leading to higher anxiety levels in both the healthy and those with pre-existing mental health problems [26–28]. The number of new cases recorded daily in the country before when the questionnaires were distributed was 100- 200 and the deaths were 2-5 in number per day [10]. This data trend is a far cry from the situation observed during the time of study when a daily rise of 400- 500 new cases each day and 10- 20 deaths per day were the trend [10]. This variation in the impact of the disease may also explain in part the positive relationship demonstrated between the fear of being infected and psychological distress. Besides, a good number of our respondents rely on social media as their source of information. Misleading information and uncertainties about the virus even from reputable health organizations in the social media and other sources of media can invoke a sense of dread and helplessness among the populace. This calls for the need to create and make mandatory the psychological assessment and intervention of populations at risk such as positive cases in quarantine or in isolation as well as patients who just recently recovered from the disease. It is also critical to desist from discrimination and stigmatization of those found to be positive with the virus.

5. CONCLUSION

Psychological distress is a significant co-morbidity of the COVID -19 pandemic among adults residing in Nigeria. Significant predictors to psychological distress include age, socio-economic class, working status, and perception of the likelihood of being infected with the disease while non-significant predictors include marital status, education, and source of information on COVID-19. NCDC, the nation's authorized source of information on COVID-19 is the least recognized across all geo-political zones. Despite the increasing prevalence of psychological stress and its ravaging chronic effects on the populace, mental health is still being largely neglected by both health organizations and interested parties involved in the nation's COVID-19 pandemic response. This calls for the need to reverse this trend.

6. STRENGTHS AND LIMITATION

This nationwide study attempted to reach all factions of the society via the use of social media networks which is accessible through mobile phone devices connected to the internet. The sample size was large enough to include a variety of individuals with unique socio-demographic characteristics. This means of data gathering, however, excludes the less privileged members of the society who are unable to afford these gadgets. Also, in this study, we observed that respondents from the Northern region of the country had the lowest response rate which perhaps may be related to their conservative nature and cultural norms. Nevertheless, the fact that this study was conducted during the lockdown period enabled us to understudy the affected population with interesting outcomes.

7. RECOMMENDATIONS

A regular psychosocial assessment is recommended for every adult in Nigeria at any chance meeting with a physician, with particular attention to the more vulnerable groups identified. Early detection and prompt psychological interventions are crucial to improving the quality of life in affected persons.

Furthermore, efforts should be made by the Nigerian government to ensure that NCDC takes its rightful place as the prime source of information concerning the COVID-19 pandemic, by increasing its reach down to the grassroots.

CONSENT AND ETHICAL APPROVAL

The guidelines on research involving the use of human subjects according to Helsinki declaration was adhered to. Online consent was obtained from participants. Participants were allowed to leave the survey at any time they desired. Confidentiality of information was assured, and the survey was anonymous.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mental health and psychosocial considerations during the COVID-19 outbreak [Internet]. Available:https://www.who.int/publications/i/item/WHO-2019-nCoV-MentalHealth-2020 [Cited 2020 Jul 9].
2. Coronavirus disease 2019 [Internet]. Available:https://www.who.int/emergencies/diseases/novel-coronavirus-2019 [Cited 2020 Jun 27].
3. Rossi R, Socci V, Talevi D, Mensi S, Niolu C, Pacitti F, et al. COVID-19 pandemic and lockdown measures impact on mental health among the general population in Italy. An N=18147 web-based survey. medRxiv [Internet]; 2020; 2020.04.09.20057802. Available:https://www.medrxiv.org/content/10.1101/2020.04.09.20057802v1 [Cited 2020 Jul 9].
4. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: Exposure, risk perception, and altruistic acceptance of risk. Can J Psychiatry. 2009;54:302–11.
5. Bai YM, Lin CC, Lin CY, Chen JY, Chue CM, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. Psychiatr Serv. 2004;55:1055–7.
6. Cénat JM, Felix N, Blais-Rochette C, Rousseau C, Bukaka J, Derivois D, et al. Prevalence of mental health problems in populations affected by the Ebola virus disease: A systematic review and meta-analysis. Psychiatry Research. Elsevier Ireland Ltd. 2020;289(1):113033.
7. 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. Int J Environ Res Public Health; 2020 Available:/pmc/articles/PMC7084952/?report=abstract [Cited 2020 Jul 9];17:1729.
8. 20% increase in patients with mental illness since coronavirus outbreak: Survey - India News [Internet]. Available:https://www.indiatoday.in/india/story/20-per-cent-increase-in-patients-with-mental-illness-since-coronavirus-outbreak-survey-1661584-2020-03-31 [Cited 2020 Jul 9].
9. Kumar A, Nayar KR. COVID 19 and its mental health consequences [Internet]. Journal of mental health (Abingdon, England). NLM (Medline). 2020;1–2.

Available:https://www.tandfonline.com/doi/abs/10.1080/09638237.2020.1757052 [cited 2020 Jul 9].

10. NCDC Coronavirus COVID-19 Microsite [Internet]. Available from: https://covid19.ncdc.gov.ng/ [Cited 2020 Jul 14].
11. Coronavirus disease (COVID-19) [Internet]. Available:https://www.who.int/emergencies/diseases/novel-coronavirus-2019 [Cited 2020 Jul 14].
12. Suleiman D. Mental health disorders in Nigeria: A highly neglected disease. Ann Niger Med [Internet]. 2016;10:47. Available:http://www.anmjournal.com/text.asp?2016/10/2/47/206214 [Cited 2020 Jul 23]
13. The New Economy of Africa [Internet]. Available:https://www.cgdev.org/reader/new-economy-africa-opportunities-nigerias-emerging-technology-sector?page=0 [Cited 2020 Jul 9].
14. Nigeria Overview [Internet]. Available:https://www.worldbank.org/en/country/nigeria/overview [Cited 2020 Jul 9].
15. Nigeria: Introduction >> globalEDGE: Your source for Global Business Knowledge [Internet]. Available:https://globaledge.msu.edu/countries/nigeria [Cited 2020 Jul 9].
16. Oyedeji G. Socioeconomic and cultural background of hospitalized children in Ilesa, Nigeria. Niger J Paediatr. 1985;12:111–7.
17. Kessler Psychological Distress Scale (K10) - Statistics Solutions [Internet]. Available:https://www.statisticssolutions.com/kessler-psychological-distress-scale-k10/ [Cited 2020 Jul 9].
18. Amoran OE, Lawoyin TO, Oni OO. Risk factors associated with mental illness in Oyo State, Nigeria: A community based study. Ann Gen Psychiatry [Internet]. 2005;4:19. Available:http://annals-general-psychiatry.biomedcentral.com/articles/10.1186/1744-859X-4-19 [Cited 2020 Jul 14]
19. Ogunsemi OO, Oluwole FA, Abasiubong F, Erinfolami AR, Amoran OE, Ariba AJ, et al. Detection of mental disorders with the patient health questionnaire in primary care settings in Nigeria. Ment Illn. 2010;2:46–50.
20. Gureje O, Uwakwe R, Oladeji B, Makanjuola VO, Esan O. Depression in adult Nigerians: Results from the Nigerian Survey of Mental Health and Well-being. J Affect Disord. 2010;120:158–64.
21. 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 [Internet]. Vol. 33, General Psychiatry. BMJ Publishing Group. 2020;100213. Available:/pmc/articles/PMC7061893/?report=abstract [Cited 2020 Jul 16].
22. Hussain W. Role of Social Media in COVID-19 Pandemic. Int J Front Sci [Internet]. 2020;4. Available:http://publie.frontierscienceassociates.com/index.php/tijfs/article/view/144 [Cited 2020 Jul 16]
23. Hua J, Shaw R. Corona virus (Covid-19) "infodemic" and emerging issues through a data lens: The case of china. Int J Environ Res Public Health [Internet]. 2020;17:2309. Available:www.mdpi.com/journal/ijerph [Cited 2020 Jul 16]
24. Social media giants to stop fake news spreading the coronavirus | BCS - The Chartered Institute for IT [Internet]. Available:https://www.bcs.org/content-hub/social-media-giants-to-stop-fake-news-spreading-the-coronavirus/ [Cited 2020 Jul 16].
25. 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 J Psychiatr. 2020;51:102083.
26. Fear Itself: The Origin and Nature of the Powerful Emotion that Shapes Our Lives and Our World: Dozier, Rush W.: 9780312194123: Amazon.com: Books [Internet]. Available:https://www.amazon.com/Fear-Itself-Origin-Powerful-Emotion/dp/0312194129 [Cited 2020 Jul 16].

27. Restubog SLD, Ocampo ACG, Wang L. Taking control amidst the chaos: Emotion regulation during the COVID-19 pandemic. Journal of Vocational Behavior. 2020;119:103440.

28. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. International Journal of Social Psychiatry. 2020;66:317–20.

APPENDIX I

Oyedeji's Social Classification

Grade	Occupation	Level Of Education
1	Senior public servants, professionals, managers, large scale traders, business men, contractors	University graduates or equivalents
2	Intermediate grade public servants and senior school teachers	National certificate or ordinary national diploma holder
3	Junior school teachers, drivers, artisans	Secondary school certificate, grade 2 teacher certificate or equivalent
4	Petty traders, labourers, messengers and similar grades	Modern 3 and primary 3 certificates
5	Unemployed	No formal education

Social class = (father's occupation + education) + (mother's occupation + education)
4

The resultant score taken to the nearest whole number is categorized as follows:

Upper socioeconomic class - Class 1 and 2
Middle socioeconomic class - Class 3
Lower socioeconomic class - Class 4 and 5

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/60051