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Perceived risk of COVID-19 diagnosis and stigma among Nigerians

Darlingtina Esiaka¹,*, Candidus Nwakasi², Kafayat Mahmoud³, Aaron Akpu Philip⁴

¹Department of Family Medicine & Community Health, Rutgers University, NJ, USA
²Department of Health Policy and Management, Providence College, Rhode Island, USA
³School of Sociology, University of Kansas, Lawrence, KS, USA
⁴School of Public Health & Social Work, Queensland University of Technology, Australia

Abstract

The World Health Organization (WHO) classified Nigeria as one of the 13 African countries with a higher risk of spreading COVID-19. Although the Nigerian government and its health agencies set directives in place to help curb the spread of COVID-19, there are instances of unconcerned attitudes and adherence to false and superstitious beliefs surrounding COVID-19 among Nigerians. The current study examined the general perception of COVID-19 risk among Nigerians. Additionally, it examined the fear of possible stigmatization if an individual is diagnosed with COVID-19. A cross-section of 332 Nigerian men and women responded to measures on perceived vulnerability to diseases, perception of risk of being infected with COVID-19, COVID-19 stigma, and social and demographic characteristics. The findings show that respondents with a higher perception of vulnerability to diseases reported higher COVID-19 risk and perception of COVID-19-related stigma. Furthermore, we found that gender, age, and education impacted COVID-19 risk and perception of COVID-19-related stigma. Our findings suggest that risk perceptions and attitudes towards COVID-19 can impact the level of preparedness against a pandemic. Also, the findings could inform strategies for the proper implementation of health protective measures at national, state, and local government levels during a viral outbreak.

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Introduction

A newly identified virus, SARS-COV-2, has emerged and caused a worldwide pandemic. Called COVID-19, the virus belongs to the family of coronaviruses, known examples of which are the Severe Acute Respiratory Syndrome (SARS) and the Middle East respiratory syndrome (MERS) [19]. The virus can be transmitted from person to person, primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. COVID-19 clinical symptoms include dry cough, fatigue, shortness of breath, sore throat, headache, nausea or vomiting, nasal congestion, and diarrhea [36],

* Corresponding author at: Department of Family Medicine & Community Health, Rutgers University, 303 George Street, Suite 301, room 303, New Brunswick, NJ, 08901
E-mail address: de255@rwjms.rutgers.edu (D. Esiaka).

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In most cases, individuals infected with COVID-19 experience mild to moderate respiratory symptom [33]. In rarer cases, the virus can lead to severe respiratory disease, organ failure, or fatality [9]. World Health Organization has confirmed that no specific treatment or vaccine for this infection has been discovered at this time [48].

Since the outbreak of COVID-19 in December 2019, the world has recorded exponential growth in infection cases [40]. As of September 21, 2020, the world reported 30,949,804 confirmed cases of COVID-19, with 959,116 deaths worldwide [48]. The global pandemic has heavily impacted various communities and countries, including Nigeria. The World Health Organization enlisted Nigeria among the thirteen African countries identified as high-risk zones for the spread of COVID-19 due to the high population. The estimated number of Nigerians in 2019 was over 200 million [46], with 40 percent of the total population (over 80 million people) living below the country’s poverty line of 137,430 naira ($381.75) per year [42].

The first confirmed case of coronavirus in Nigeria was reported on February 27, 2020, by the National Center for Disease Control (NCDC). As of September 20, 2020, there were 57,242 confirmed cases and 1,098 deaths in the country [29]. As COVID-19 spread rapidly across Nigeria, the Nigerian government implemented drastic measures to reduce the spread of the virus. Some of the measures included closure of schools, markets and business places, the prohibition of religious and social gatherings, enforcement of practices such as quarantine, social-distancing, facemask wearing in public spaces, and total lockdown. Despite specific guidance issued by government officials in an effort to prevent the spread, there are daily accounts of Nigerians disregarding or refusing to adhere to government recommendations. Research that examined the practice of protective measures during the H1N1 outbreak found that public cooperation with respect to practicing of protective measures is dependent upon their risk perception of a pandemic [45].

Perception of risk and susceptibility to diseases

Risk perception is an individuals’ perceived vulnerability to diseases/illnesses [15]. The process of forming risk perceptions is contextually based and can vary from individual to individual. For example, individuals whose family members have been diagnosed with a disease tend to have a more pessimistic risk perception for that specific disease [4]. How frequently or prevalently certain diseases are presented in the media, in general, can also alter individuals’ risk perceptions [5]. When health threats become more urgent and severe, risk perceptions also become higher [38]. Logically, risk perception has a substantial impact on individuals’ health behaviors and modification of risk perceptions can contribute to subsequent adjustments in health behaviors.

According to Rogers [35], individuals’ motivation to relinquish certain enjoyable activities that could contribute to diseases, such as overeating or smoking, stems from their personal beliefs of possible resulting health consequences. Taken together, perceived susceptibility to diseases is a crucial factor and determinant of health behavior. While fear which is driven by misinformation counters public health efforts in combating the virus [34], the fear offers an understanding of how people appreciate their health and the severity of the disease [24]. This fear brings to fore the genuine concern about the virulence of SARS-CoV-2 which is exacerbated by the unavailability of a vaccine or globally accepted treatment [23,27].

Additionally, although Africa has garnered experience in combating epidemics such as Ebola and HIV [13], stigma and discrimination are not alien to the continent. Stigma is a concept used to describe the perceived negative experience of persons or individuals with regard to some characteristics they have which are not universally accepted as the norm within their society [16]. This usually leads to a reduction in an individual’s perceived status in society and perceived or real discrimination [16,26]. Perceptions of stigma are sometimes influenced by cultural beliefs about disease etiology [28]. Within the Nigerian context, fear, anxiety, and stigma regarding epidemics have been recorded in the literature [1].

To contextualize the issue of stigma regarding infectious or communicable diseases, one can draw on the HIV/AIDS epidemic in Nigeria. While HIV-related stigma is known to result in loss of jobs, exclusion from social networks, and physical violence [11], it also impacts on HIV testing, disclosure of seropositivity and treatment [31,32,49]. Additionally, certain factors have been reported to influence stigma in relation to infectious and communicable diseases in Nigeria. For example, people of lower socioeconomic status with lower educational levels were more likely to stigmatize people who are infected with infectious diseases [7]. In contrast, people with higher levels of education and higher socioeconomic status were less likely to stigmatize people who were infected with infectious diseases [7].

Current study

Researchers argue that the practice of health-protective measures by individuals or the public is dependent on high levels of perceived risks associated with illnesses [35]. This decision is significantly premised on the individual’s or public’s assessment of the disease’s severity or their vulnerability to the disease [35]. Arguably, the absence of a vaccine for COVID-19 and the limited resources available in combating the virus could influence high perceived risk [13] among individuals and communities. High levels of perceived risk could present some implications for public health interventions.

These issues are the justification for this study. As a result, the study, using a sample of Nigerians residing in Nigeria, explored the influence of perceived disease vulnerability, perceived threat of COVID-19, and sociodemographic factors on perceived COVID19-related stigma and risk of COVID-19 diagnosis.
Method

Participants and Procedure

This study included a sample of Nigerian men and women (N=336), aged 19 to 76 years. We collected the data using Qualtrics link that was published on: 1) group and personal pages on Facebook website, 2) various WhatsApp groups for Nigerians, 3) sent through text messaging, and 4) personal LinkedIn pages. The participants responded to measures assessing perceived vulnerability to disease, perceived stigma related to COVID-19 diagnosis, general risk perception, and additional demographic, social and ecological characteristics. The online survey was designed to last 20 minutes on average, and respondents received no monetary gift for study participation. This investigation was approved by the Institutional Review Board (IRB) of Union College, United States.

Measures

Primary outcomes

Perceived risks of COVID-19 Diagnosis. The perceived risk of Nigerians being diagnosed with COVID-19 and the perceived risk of being diagnosed with COVID were measured using single-item questions that examined the COVID risk perception among Nigerians. The questions were: “How likely are Nigerians to be diagnosed with Coronavirus?” and “How likely do you feel as a Nigerian that you will be diagnosed with Coronavirus?” Response choices to the questions were assessed using a 6-point Likert scale from 0 (not at all likely) to 5 (very likely). Additionally, respondents provided reasons for their responses by selecting from a list of 8 statements such as: “Nigerians don’t easily get sick,” “Nigerians don’t easily die of sicknesses,” and “Nigerians take care of their health.” The participants were given an opportunity to provide further reasons for their perceived beliefs regarding COVID-19 risk.

Perception of COVID-19-related stigma. The perceived stigma related to COVID-19 was assessed using 4-item statements that measured the degree to which participants agree with perceived COVID-19-related stigma. In this study, we did not directly assess individual tendencies to engage in the stigmatization of other people diagnosed with COVID-19. Rather, we assessed a more normative perception of COVID-19 related stigma given the novelty of the disease as at the time of data collection. Examples of items on the scale are: “a person diagnosed with Coronavirus will likely be stigmatized” and “if a person recovers from Coronavirus diagnosis, everyone in the community will likely abandon that person.” Respondents responded to the questions on a 6-point Likert scale from 0 (strongly disagree) to 5 (Strongly agree). The scores of the 4 items were made a composite score with Cronbach’s α = 0.71. Higher scores indicate a higher perception of COVID-19-related stigma.

Predictor variables

Perceived Vulnerability to Diseases. The Perceived Vulnerability to Diseases (PVD) scale [10], a 15-item self-report questionnaire designed to assess individual differences in concerns about the transmission of diseases. For the purpose of this study, the questionnaire was modified into a 12-item scale to make it more applicable to the general viral outbreaks. The participants rated their agreement with each of the items using a 6-point Likert scale of 0 (Strongly disagree) to 5 (Strongly agree). Ratings across 7 items were averaged to create a composite PVD score, with higher scores indicating greater PVD. The adapted scale had a Cronbach’s Alpha of 0.72.

Perceived Threat of COVID-19 to Nigerians. The perceived threat of COVID-19 was measured using a statement that assessed the general perceived seriousness, impact, and overall threat of COVID-19 to Nigerians. The statement was: “the Nigerian government is exaggerating the health threat of COVID-19.” Participants indicated the degree to which they agree with the statements using a 6-point Likert scale from 0 (strongly disagree) to 5 (strongly agree). Higher scores indicate a lower perceived threat of COVID-19 to Nigerians.

Demographic Characteristics. We included six demographic variables in the analyses: age, marital status, education, subjective social standing, presence of children, and the number of COVID-19 cases in town of residence. Although the study was designed to only include Nigerians and Nigerians who reside in Nigeria, we asked the participants to self-identify their nationality and country of residence. It is our assumption that the participants are from various Nigerian ethnic backgrounds such as Igbo, Hausa, Yoruba, Tiv, Urhobo, etc.

Data Analytic Strategy

We conducted descriptive analyses to provide measure performance and a profile of the sample’s sociodemographic characteristics. We conducted two linear regressions to determine the associations between perceived risk of COVID-19, perceived COVID-19-related stigma, predictors of interest, and other covariates. All statistical analyses were conducted using SPSS version 23.0 (SPSS Inc., Chicago, IL) and R software, with a statistically significant p-value level set at 0.05.

Result

Sample characteristic. Participants were 336 self-identified Nigerian men and women resident in Nigeria, with a mean age of 33.35 (SD = 7.10) years. Over half of the sample (69.3%) reported having a college degree or more. The mean subjective
social standing reported by the participants, to show how they perceive themselves to stand on a ten-rung ladder (from 1 = worst off to 10 = best off) that represented everyone in the society, was 5.34 (SD = 1.71). Approximately 46% reported being married. Other demographic, health, and social characteristics are provided in Table 1.

Perceived risk of contracting COVID-19

All reported results are of statistically significant relationships when other variables are controlled for in the regression model (see Table 2). The result shows that Nigerian women perceived the risk of Nigerians being diagnosed with COVID-19 more than men (β = 0.3237). Also, an increase in perceived vulnerability to diseases is associated with an increase in perceived risk of Nigerians being diagnosed with COVID-19 (β = 0.1683) and an increase in perceived personal risk of contracting the virus (β = 0.503). Additionally, increase in the perception that the Nigerian government is exaggerating the health threat of COVID-19 is associated with a decrease in perceived risk of Nigerians being diagnosed with COVID-19 (β = -0.1245). Further, an increase in subjective social standing is associated with a decrease in perceived risk of Nigerians being diagnosed with the virus and in the perceived personal risk of being diagnosed with COVID-19.

COVID-19-related stigma

The results are displayed on Table 3. Age was found to be associated with the perception of COVID-19-related stigma. An increase in age by a year is associated with a 0.023 unit decrease in the perception of COVID-19-related stigma. Education was inversely associated with the perception of COVID-19-related stigma risk (β = -0.104). A year increase in education is associated with a 0.104 decrease in perception of COVID-19-related stigma. Also, compared to married Nigerians, those who are single have higher perception of COVID-19-related stigma (β = 0.289). There is a direct relationship between perceived vulnerability to disease and the perception of COVID-19-related stigma. A unit increase in perceived disease vulnerability increases the perception of COVID-19-related stigma by 0.116.

Discussion

The current study examined socio-demographic differences in the perceptions of stigma towards COVID-19, as well as risk and vulnerability towards the COVID-19 pandemic in Nigeria. The study is important given the immediacy of COVID-19 crisis and the need for effective public health interventions for infectious diseases.
We found that compared to men, women were more likely to think that Nigerians had an increased risk of contracting COVID-19. This result demonstrates women’s proactive attitude towards news about pandemics or other health issues. The result may reflect findings from previous studies [12,43] which found that women were more likely to seek health information, adopt beneficial health behaviors and seek health care than men. Our findings highlight the unstated impact of gender roles which places most responsibility on women to maintain and improve the health status of members of their families.

Higher SES which is measured by subjective social standing was found to be inversely associated with perceived risk of contracting COVID-19. This directly supports the theory of fundamental causes of diseases which states that persons with higher socioeconomic status are more likely to have better access to health information, health care services, and preventive services which serve to protect them from being vulnerable to diseases [37]. This finding has important implications for public health measures to be adopted, especially with regards to reducing exposure or vulnerability to infectious diseases. For instance, previous studies show that increased vulnerability directly informs preventive health behaviors adopted by people [2,17,44].

Additionally, the perception that the government is exaggerating the impact of COVID-19 is associated with decreased perception of risk of contracting the disease. This has several implications such as likelihood of complying with preventive public health measures. For instance, when citizens believe that their government has their best interests and is providing useful up-to-date information, the level of trust is likely to increase as will their compliance with governmental directives. This finding is supported by the previous research on assessing the role of institutional trust in determining citizens’ adherence to governmental public health measures during public health crises, and the role that it plays in exacerbating or reducing the spread of diseases [3,25,45]. Our findings add to the body of literature on the role that perceived vulnerability and risk to infectious diseases, such as COVID-19, would have on the preventive behaviors adopted by individuals especially if there is widespread distrust of governmental public health measures and directives.

Our study results also indicated that younger persons are more likely to perceive the likelihood of being stigmatized due to COVID-19 than their older counterparts. This finding is consonant with the findings of other studies where younger persons have a higher level of perceived stigma from a disease [22,41]. However, our finding contrasts sharply with research showing that older adults with diseases are more likely to perceive and experience stigmatization (e.g., [14,20,47]). Also, it our finding contrasts with that of Shibre and colleagues [39] who found age as an insignificant predictor of high levels of perceived stigma. Perhaps this increased perception of stigma among younger persons is related to beliefs that younger people should be hale and hearty, or that they would not be able to freely socialize or engage in social activities with their peers. This could be a hindrance to seeking health care and also increasing the risk of spread of disease. Equally important is the fact that prior research on attitudes and perceptions towards stigma focused on mental health/illness [21,39], tuberculosis [6], epilepsy [28], malaria [30]. To the best of our knowledge, this is the first study looking at stigma due to viral respiratory infectious diseases in Nigeria.

In line with a common finding in health research [8,18,50], we found that higher levels of educational attainment were predictive of reduced levels of perceived stigma. Individuals with higher levels of education may have more access to unbiased information about the risks and complications of COVID-19 as well as recovery options compared to persons with lower levels of education. Thus, they are more likely to seek healthcare and engage in preventive health behaviors. Additionally, single persons, compared to married persons were more likely to have higher perceptions of stigma related to COVID-19. Previous research found that single persons were less inclined to reveal their disease conditions due to the fear of not finding romantic partners [6]. It is also possible that those who are single are bothered about social restrictions such as not being able to hang out with friends that comes with being diagnosed with COVID-19. This finding will benefit from further exploration on the influence of marital status on stigma-associated perceptions of diseases. Interestingly, persons with higher perceived vulnerability to disease were more likely to perceive themselves as susceptible to stigma related to COVID-19. This may be due to the fact that COVID-19 is a highly fatal communicable disease that could manifest itself with
obvious symptoms such as coughing and sneezing in public spaces, and subsequently result in other people actively avoiding the suspected infected person.

Limitation

The study is not without limitations. First, the sampling method and the size of the sample limits our ability to generalize our findings to every Nigerian. Second, we collected the data online and may have unintentionally prevented Nigerians without access to the internet from participating in the survey. Lastly, due to the urgency to collect the data during the peak of COVID-19 outbreak and government lockdown, we collected the data over a week period. There remains the possibility that had the data been collected for a more extended period, we could have reached a wider range of Nigeria and recruited more participants for the study.

Conclusion

We examined COVID-19 risks perception among Nigerians and found that key demographic characteristics (age, gender) predict COVID-19 risk perceptions. Our data reiterates the importance of ensuring that individuals have an accurate perception of the threat posed by COVID-19 and viral infections and are well-informed about the impact of COVID-19 diagnoses on their social interactions. Recognizing the need for accurate perception of COVID-19 will help in the development and implementation of public health strategies for curbing viral infections and diseases. Equally important, it will ensure the success of public health strategies that will promote health prevention behaviors in individuals in times of a pandemic.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

[1] A.A. Awofala, O.E. Ogundele, HIV epidemiology in Nigeria, Saudi J. Biol. Sci. 25 (4) (2018) 697–703.
[2] L. Belcher, M.R. Sternberg, R.J. Wolitski, P. Halkitis, C. Hoff, Study Team SUMS, Condom use and perceived risk of HIV transmission among sexually active HIV-positive men who have sex with men, AIDS Educ. Prev. 17 (1) (2005) 79–89.
[3] R.A. Blair, B.S. Morse, L.L. Tsai, Public health and public trust: Survey evidence from the Ebola Virus Disease epidemic in Liberia, Soc. Sci. Med. 172 (2017) 89–97.
[4] L.S. Chen, K.A. Kaphingst, Risk perceptions and family history of lung cancer: Differences by smoking Status, Public Health Genomics 14 (1) (2010) 26–34.
[5] D.H. Choi, W. Yoo, G.Y. Noh, K. Park, The impact of social media on risk perceptions during the MERS outbreak in South Korea, Comput. Hum. Behav. 72 (2017) 422–431.
[6] A.L. Cremers, M.M. de Laat, N. Kapata, R. Gerrets, K. Klipstein-Grobusch, M.P. Grobusch, Assessing the consequences of stigma for tuberculosis patients in urban Zambia, PLoS One 10 (3) (2015) e0115961.
[7] M. Dahlui, A.B. Nazar Azahar, R. Zakri, O.M. Oche, F.O. Adekunjo, K. Chinna, HIV/AIDS related stigma and discrimination against PLWHA in Nigerian population, PLoS One 10 (12) (2015).
[8] E.S. Donkor, J. Sandall, The impact of perceived stigma and mediating social factors on infidelity-related stress among women seeking infidelity treatment in Southern Ghana, Soc. Sci. Med. 65 (8) (2007) 1683–1694.
[9] Y. Du, L. Tu, P. Zhu, M. Mu, R. Wang, P. Yang, … C. Xu, Clinical features of 85 fatal cases of COVID-19 from Wuhan. A retrospective observational study, Am. J. Respir. Crit. Care Med. 201 (11) (2020) 1372–1379.
[10] L.A. Duncan, M. Schaller, J.H. Park, Perceived vulnerability to disease: Development and validation of a 15-item self-report instrument, Pers Individ Dif 47 (6) (2009) 541–546.
[11] V.A. Earnshaw, S.R. Chaudoir, From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures, AIDS Behav. 13 (6) (2009) 1180, doi:10.1007/s10461-009-9593-3.
[12] S. El, Gender differences in health information behaviour: a Finnish population-based survey, Health Promot. Int. 30 (3) (2015) 736–745.
[13] W.M. El-Sadr, J. Justman, Africa in the Path of Covid-19, N. Engl. J. Med. (2020), doi:10.1056/NEJMp2008193.
[14] C.A. Emlet, You’re awfully old to have this disease”: Experiences of stigma and ageism in adults 50 years and older living with HIV/AIDS, Gerontologist 46 (6) (2006) 781–790.
[15] E. Fischhoff, A. Bostrom, M.J. Quadrel, Risk perception and communication, Annu. Rev. Public Health 14 (1) (1993) 183–203.
[16] E. Goffman, Stigma Englewood Cliffs, NJ: Spectrum (1963).
[17] J.Y. Goh, S.E. O’Sullivan, S.E. Shortall, N. Zordan, A.M. Piccinini, H.G. Potter, … M.V. King, Gestational poly (1: C) attenuates, not exacerbates, the behavioral, cytokine and mTOR changes caused by isolation rearing in a rat ‘dual-hit’model for neurodevelopmental disorders, Brain Behav. Immun. (2020).
[18] K.M. Griffiths, H. Christensen, A.F. Jorm, Predictors of depression stigma, BMC Psychiatry 8 (1) (2008) 25.
[19] A.E. Gorbalenya, S.C. Baker, R.S. Baric, R.J. de Groot, C. Drosten, A.A. Gulyaeva, … D. Penzar, The species severe acute respiratory syndrome related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2, Nat Microbiol 5 (2020) 536–544.
[20] K.J. Harrison, L.J. Hunt, C.S. Ritchie, K. Vaffe, Dying with dementia: under-recognized and stigmatized, J. Am. Geriatr. Soc. 67 (8) (2019) 1548.
[21] A.S. Jegede, The Yoruba cultural construction of health and illness, Nordic J. Afr. Stud. 11 (3) (2002) 14.
[22] K.S. Jennings, J.H. Cheung, T.W. Britt, K.N. Goguen, S.M. Jeffirs, A.L. Peasley, A.C. Lee, How are perceived stigma, self-stigma, and self-reliance related to treatment-seeking? A three-path model, Psychiatr. Rehabil. J. 38 (2) (2015) 109.
[23] M. Khosravi, Perceived Risk of COVID-19 Pandemic: The Role of Public Worry and Trust, Electr. J. General Med. 17 (4) (2020) em203 2020.
[24] T. Kobayashi, S.-M. Jung, N.M. Linton, R. Kinoshita, K. Hayashi, T. Miyama, A. Anzai, Y. Yang, B. Yuan, A.R. Akhmetzhanov, Communicating the risk of death from novel coronavirus disease (COVID-19), J. Clin. Med. 9 (2) (2020) 1–7, doi:10.3390/jcm9020580.

[25] R. Kutalek, S. Wang, M. Fallah, C.S. Wesseh, J. Gilbert, Ebola interventions: listen to communities, Lancet Glob. Health 3 (3) (2015) e131.

[26] B.G. Link, J.C. Phelan, Conceptualizing stigma, Annu. Rev. Sociol. 27 (1) (2001) 363–385.

[27] C.C. Lai, T.P. Shih, W.C. Ko, H.J. Tang, P.K. Hsueh, Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges, Int. J. Antimicrob. Agents (2020) 105924.

[28] D. Mushiri, H. Hunter, C. Mtuya, G. Mshana, E. Aris, R. Walker, Social–cultural aspects of epilepsy in Kilimanjaro Region, Tanzania: knowledge and experience among patients and carers, Epilepsy Behav. 20 (2) (2011) 338–343.

[29] Nigeria Centre for Disease Control (2020). COVID-19 Situation Report 205. Available at: https://ncdc.gov.ng/diseases/sitreps/?cat=14andname=An%20update%20of%20COVID-19%20outbreak%20in%20Nigeria

[30] P. Nuwaha, People's perception of malaria in Mbarara, Uganda, Trop. Med. Int. Health 7 (5) (2002) 462–470.

[31] O.T. Okareh, O.M. Akpa, J.O. Okunola, T.A. Okoror, Management of conflicts arising from disclosure of HIV status among married women in southwest Nigeria, Health Care Women Int. 36 (2) (2015) 149–160, doi:10.1080/07399332.2013.794461.

[32] I. Okorokwo, U. Okeke, A. Chimweuba, P. Iheanacho, Nonadherence factors and sociodemographic characteristics of HIV-infected adults receiving antiretroviral therapy in Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria, Int. Sch. Res. Notices 2013 (2013), doi:10.1155/2013/843794.

[33] A.S. Ral, A.J. Sauer, COVID-19 pandemic and cardiovascular disease, US Cardiol. Rev. 14 (2020) e01.

[34] S.Y. Ren, R.D. Gao, Y.L. Chen, Fear can be more harmful than the severe acute respiratory syndrome coronavirus 2 in controlling the corona virus disease 2019 epidemic, World J. Clin. Cases 8 (4) (2020) 652.

[35] R.W. Rogers, A protection motivation theory of fear appeals and attitude change, J. Psychol. 91 (1975) 93–114.

[36] Y. Peng, Y.H. Zhou, Is novel coronavirus disease (COVID-19) transmitted through conjunctiva? J. Med. Virol. (2020), doi:10.1002/jmv.25753.

[37] J.C. Phelan, B.G. Link, A. Diez-Roux, I. Kawachi, B. Levin, “Fundamental causes” of social inequalities in mortality: a test of the theory, J. Health Soc. Behav. 45 (3) (2004) 265–285.

[38] J.A. Shepperd, C. Findley-Klein, K.D. Kwavnicl, D. Walker, S. Perez, Bracing for loss, J. Pers. Soc. Psychol. 78 (4) (2000) 620.

[39] T. Shibre, A. Negash, G. Kuligren, D. Kebede, A. Alem, A. Fekadu, … L. Jacobsson, Perception of stigma among family members of individuals with schizophrenia and major affective disorders in rural Ethiopia, Soc. Psychiatry Psychiatr. Epidemiol. 36 (6) (2001) 299–303.

[40] B. Tang, X. Wang, Q. Li, N.L. Bragazzi, S. Tang, Y. Xiao, J. Wu, Estimation of the transmission risk of the 2019-nCoV and its implication for public health interventions, J. Clin. Med. 9 (2) (2020) 462.

[41] R. Thara, T.N. Srinivasan, How stigmatising is schizophrenia in India? Int. J. Soc. Psychiatry 46 (2) (2000) 135–141.

[42] The World Bank, (2020). Nigeria releases new report on poverty and inequality in country. https://www.worldbank.org/en/programs/jsms/brief/nigeria-releases-new-report-on-poverty-and-inequality-in-country

[43] Tong V., Raynor D.K. and Aslani P. (2014) Gender differences in health and medicine information seeking behaviour: a review.

[44] J. Van Der Pligt, Perceived risk and vulnerability as predictors of precautionary behaviour, Br. J. Health Psychol. 3 (1) (1998) 1–14.

[45] W. Van der Weerd, D.R. Timmermans, D.J. Beaujean, J. Oudhoff, J.E. van Steenbergen, Monitoring the level of government trust, risk perception and intention of the general public to adopt protective measures during the influenza A (H1N1) pandemic in the Netherlands, Biomed. Chromatogr. (2011).

[46] S. Varrella, Demographics of Nigeria - statistics & facts, Statista (2020) https://www.statista.com/topics/6477/demographics-of-nigeria/#dossiersummary__chapter6

[47] P. Werner, I. Stein-Schvachman, J. Heinik, Perceptions of self-stigma and its correlates among older adults with depression: a preliminary study, Int. Psychogeriatr. 21 (6) (2009) 1180.

[48] World Health Organization (2020) WHO Coronavirus disease (COVID-19) dashboard. Available at: https://Covid19.who.int/.

[49] L. Yahaya, A. Jimoh, O. Balogun, Factors hindering acceptance of HIV/AIDS voluntary counseling and testing (VCT) among youth in Kwara State, Nigeria, Afr. J. Reprod. Health 14 (3) (2010) 159–164 https://gateway.library.qut.edu.au/login?url=https://search.proquest.com/docview/858850283?accountid=13380.

[50] A. Zieger, A. Mungee, G. Schomerus, T.M.T. Ta, M. Dettling, M.C. Angermeyer, E. Hahn, Perceived stigma of mental illness: A comparison between two metropolitan cities in India, Indian J Psychiatry 58 (4) (2016) 432.