Modes of Transmission of Covid-19 among South-West Nigerians: The Empirical Research of the Signs, Symptoms and the Remedies

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ABSTRACT

The study aimed at finding out the modes of transmission, signs and symptoms, and remedies of COVID-19 among South-West Nigerians: a case study of health personnel. Research questions and hypotheses were formulated to guide the study. The research design used for the study was a pure descriptive survey. Samples of 28 medical personnel were selected using stratified sampling and interviewed over the phone through contacts made available by the Nigerian Medical Association. To this effect, a structured questionnaire tagged; "MODES OF TRANSMISSION, SIGNS, SYMPTOMS AND REMEDIES OF COVID-19 AMONG SOUTH-WEST NIGERIANS QUESTIONNAIRE (MTSSRCSWNQ)" was prepared and administered. The instrument developed was made to pass through face and content validation by Medical Doctors. Instrument reliability was tested using Cronbach reliability test at 0.84 coefficient. The data obtained was analyzed using the descriptive statistics (percentage analysis) for the research hypotheses and simple regression for hypothesis. The result tested for significance at 0.05 alpha level. The result revealed that there are significant effects of COVID-19 infection on human health in South West Nigeria. One of the recommendations was that people should remain at least 2meters apart from other people, whether indoors or outdoors, regarding how far spit and little droplets can fly.

KEYWORDS: Covid-19, Prevalence, Signs and Symptoms, Transmission, Prevention

Introduction

The prevalence of coronavirus has assumed the status of a pandemic as declared by the World Health Organization (WHO). The last time the world responded to a global emerging disease epidemic of the scale of the current COVID-19 pandemic with no access to vaccines was the 1918-19 H1N1 influenza (swine flu) pandemic. In that pandemic, some communities, notably in the United States (US), responded with a variety of non-pharmaceutical interventions (NPIs) - measures intended to reduce transmission by reducing contact rates in the general population (Bootsma & Ferguson, 2007). Examples of the measures adopted during this time included closing schools, churches, bars and other social venues. Cities in which these interventions were implemented early in the epidemic were successful at reducing case numbers while the interventions remained in place and

experienced lower mortality overall. However, transmission rebounded once controls were lifted.

While our understanding of infectious diseases and their prevention is now very different compared to 1918, most of the countries across the world face the same challenge today with COVID-19, a virus with comparable lethality to H1N1 influenza in 1918. The origin of coronavirus has been traced to China (Lu, Stratton & Tang, 2020). There are no therapeutics and vaccines available as at now and there is presumably no pre-existing immunity in the population. The great majority of the most severe illnesses and deaths have occurred among the elderly and those with other chronic underlying conditions. The risk associated with COVID-19 infection for people in Nigeria and South Westerners is currently considered to be moderate to high, based on the probability of transmission and the impact of the disease. Based on the observed epidemiologic characteristics, everyone in the population is assumed to be susceptible, although there may be risk factors increasing susceptibility (Mechler, 2020). The virus spreads rapidly, and can have an enormous public health impact with substantial fatal outcomes in high-risk groups and economic and societal disruption. Evidence from studies on influenza, and from recent experience in China, suggest that non-pharmaceutical interventions reduce transmission. Therefore, it is of paramount importance that measures that are appropriate and proportionate to each phase of the pandemic are immediately put in place to interrupt human-to-human transmission chains, prevent further spread, reduce the intensity of the epidemic and slow down the increase in active cases (Li, Wei, Li, Hongwei, Shi, 2020).

Statement of Problem

Since the identification of the first case of COVID–19 in Nigeria, several efforts have been put in place by the federal and state governments to curb the prevalence and spread of the virus. The virus has spread very fast and has been identified in almost every state of the federation with the total of 58,062 cases, 1,103 deaths and 49,606 recoveries as at the time of this study (26th September, 2020). Health workers are at the front line of the outbreak response and as such are exposed to hazards (such as pathogen exposure), that puts them at risk of COVID-19 infection. Some measures have been put in place such as: closure of schools, shops and businesses, restriction of movement, and enforcement of stay-at-home order. All these measures are taken in order to curb the spread and transmission of the virus. This study therefore sought to empirically asses the modes of transmission, signs and symptoms, and remedies of COVID-19 among South-West Nigerians: a case study of health personnel.

Objectives of the Study

The main objective of the study was to assess the mode of transmission of covid-19, its signs and symptoms, and preventive measures in South West Nigeria. The specific objectives were:

1. To identify the extent of prevalence of COVID-19 pandemic in South West Nigeria.
2. To find out the modes of transmission of COVID-19 pandemic in South West Nigeria.
3. To examine the signs and symptoms of COVID-19 infection in South West Nigeria.
4. To determine the most perceived preventive measures against COVID-19 infection in South West Nigeria.

Research Questions

1. What is the extent of prevalence of COVID-19 pandemic in South West Nigeria?
2. What are the modes of transmission of COVID-19 pandemic in South West Nigeria?
3. What are the signs and symptoms of COVID-19 infection in South West Nigeria?
4. What are the most perceived preventive measures against COVID-19 infection in South West Nigeria?

Research Hypothesis

$H0_1$: There are no significant effects of COVID-19 infection on human health in South West Nigeria.

Concept of COVID-19

Coronavirus disease 2019 (COVID-19) is an illness caused by a novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus was first identified amid an outbreak of respiratory illness cases in Wuhan city, Hubei province, China. Illness caused by SARS-CoV-2 is termed COVID-19 by the World Health Organization, the new acronym derived from "coronavirus disease 2019." The name is chosen to avoid stigmatizing the virus's origins in terms of populations, geography, or animal associations. The disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. The Centers for Disease Control and Prevention (CDC) stated that more cases of COVID-19 are likely to be confirmed in the United States in the future days. The CDC also anticipated widespread of SARS-CoV-2 community spread and that most of the US population were to be exposed to the virus in future months, leading to the organization's recommendation against gatherings of 10 persons or more.

On April 3, 2020, the CDC issued a recommendation that the general public, even those without symptoms, should begin wearing face coverings in public settings where social-distancing measures are difficult to maintain in order to abate the spread of COVID-19. The CDC also advised that non-pharmaceutical interventions (mitigation and suppression) will serve as the most important response strategy in attempting to delay viral spread and to reduce disease impact. The feasibility and implications of strategies for suppression and mitigation have been rigorously analyzed and are being encouraged or enforced by many governments in order to slow or halt viral transmission. Population-wide social distancing of the entire population plus other interventions (eg, home self-isolation, school and business closures) are strongly advised. These policies may be required for long periods to avoid rebound viral transmission (CDC, 2020).

Prevalence of COVID-19 in South-West Nigeria

Nigeria's South-West region which covers Lagos, Ogun, Osun, Ondo, Oyo and Ekiti is one of the most pronounced multi-faceted and complex humanitarian and development areas known to the entire country. South-West Nigeria has two of the three largest cities in Nigeria (Lagos and Ibadan), hence its significance. The area is mostly occupied by the Yoruba tribe of Nigeria. The area functions as the economic base of the country; where much of the indigenous goods are produced and more than 70% of companies are cited there. The region is of significant status in the nation's economy and is highly populated (about 32.5 million people with annual population growth rate of 3.2%). In spite of the region's status as a national and regional economic hub, many of its city residents struggle with poor living conditions. Nearly two-fifths of the population lives in pockets of overcrowded housing, and

a quarter have no access to adequate sanitation with extreme poverty (Gralinski & Menachery, 2020). It is therefore, within this humanitarian and development context that the threat of the COVID-19 pandemic looms largest.

The index case of COVID-19 in Nigeria was confirmed in Lagos state from an Italian citizen who returned to Nigeria from Milan. He was transferred to Lagos state biosecurity facilities for isolation and testing (Oyeleke, 2020). Since the confirmation of the first case and subsequent spread in Lagos state which inhabits the highest human population in Nigeria due to its economic opportunities, Lagos state has been the epic centre of coronavirus in Nigeria. As at the time of this study (26th September, 2020), the state recorded the highest case of the pandemic; 19,174 (Lab Confirmed), 3,723 (Cases on admission), 15,246 discharged and 205 deaths. This is seconded by Abuja with cases of (5,644, Lab Confirmed), 609 (Cases on admission), 4,958 discharged and 77 deaths. The other states in the south west region were: Ogun (1,796, 44, 1,724 and 28); Osun (826, 25, 784 and 17); Oyo recorded (3,248, 893, 2,316 and 39); Ekiti recorded (317, 16, 295 and 6) while Ondo had (1,620, 40, 1,545 and 35) (NCDC, 2020). The Nigerian government has put effort in suppression of the pandemic effect in the country by enforcing total lock down in the country, especially the Lagos and FCT, postponement of social events (Eludini, 2020), placement of travel ban on 13 countries with high incidence of the virus and on religious and social gatherings of more than 50 persons (Ogundele, 2020), closure of schools and suspension of social events indefinitely (Ojerinde, 2020), establishment of COVID-19 Presidential Task Force (PTF) on Covid-19 (Daka, 2020), equipping hospitals and motivating health workers, production and distribution of face masks and palliatives and other measures to cushion the effect of the situation in the country.

Mode of Transmission

Contact and spread of covid-19 were reported to have some link to the Huanan Seafood Market in Wuhan, China, suggesting that these early infections were due to animal-to-person transmission. However, later cases were reported among medical staff and others with no history of exposure to that market or visiting Wuhan, which was taken as an indication of human-to-human transmission (Li Q et al., 2020). From China, the infection had spread to every part of the world including Nigeria which has economic relation with the Western countries. The latest guidelines from Chinese health authorities described three main transmission routes for the COVID-19, that is, droplet transmission, contact transmission and aerosol transmission.

Droplets transmission occurs when respiratory droplets (as produced when an infected person coughs or sneezes) are ingested or inhaled by individuals nearby in close proximity.

Contact transmission may occur when a person touches a surface or object contaminated with the virus and subsequently touch their mouth, nose, or eyes. Transmission events that occur through contacts are also made between susceptible and infectious individuals in the household, workplace, school or randomly in the community, with the latter depending on spatial distance between contacts. Transmissibility occur from 12 hours prior to the onset of symptoms for those that are symptomatic and from 4.6 days after infection in those that are asymptomatic with an infectiousness profile over time that results in a 6.5-day mean generation time. Symptomatic individuals therefore are 50% more infectious than asymptomatic individuals. In case of contact, following identification of a symptomatic case in the household, all household members remain at home for 7 and 14 days respectively (Gralinski and Menachery, 2020). Household contact rates double during this quarantine period, while contacts in the community reduce by 75%.

Aerosol transmission may occur when respiratory droplets mix into the air, forming aerosols and may cause infection when inhaled high dose of aerosols into the lungs in a relatively closed environment (NHC and CDC, 2020). Airborne transmission of the virus is also plausible. According to a study by scientists at Princeton University and the National Institutes of Health, UCLA published in the print edition (peer-reviewed), The New England Journal of Medicine, the virus could remain airborne for "up to 3 hours post aerosolization. The scientists found that SARS-CoV-2, the virus that causes the new disease COVID-19, was detectable in the air for up to three hours, up to four hours on copper, up to 24 hours on cardboard, and up to two to three days on plastic and stainless steel. For those reasons, officials recommend washing hands, cleaning surfaces and "social distancing" in public spaces.

Health Effects of COVID – 19 Pandemic

The effects of the COVID-19 on health of the people are as expressed in the signs and symptoms which range from asymptomatic/mild symptoms to severe illness and mortality. The most commonly reported symptoms are fever, cough, myalgia or fatigue, pneumonia, and complicated dyspnea, whereas less common reported symptoms include headache, diarrhea, hemoptysis, runny nose, and phlegm-producing cough (CDC, 2020; Huang, Wang, Li, Ren, Zhao, Jianping, Hu, 2020). Symptoms may develop from 2 days to 2 weeks following exposure to the virus. Patients with mild symptoms were reported to recover after 1 week while severe cases were reported to experience progressive respiratory failure due to alveolar damage from the virus, which may lead to death (Li, Wei, Li, Hongwei, & Shi, 2020). A pooled analysis of 181 confirmed cases of COVID-19 outside Wuhan, China, found the mean incubation period to be 5.1 days and that 97.5% of individuals who developed symptoms did so within 11.5 days of infection (Liu, Hu, Kang, Lin, Zhong, and Xiao 2020). Cases resulting in death were primarily middle-aged and elderly patients with pre-existing diseases (tumor surgery, cirrhosis, hypertension, coronary heart disease, diabetes, and Parkinson's disease). Case definition guidelines mention the following symptoms in addition to the above ones: fever, decrease in lymphocytes and white blood cells, new pulmonary infiltrates on chest radiography and no improvement in symptoms after 3 days of antibiotics treatment (Li, Guan, Wu, Wang, Zhou, & Tong, 2020).

Health care providers are at high risk of contacting COVID–19 because they are at the fore front of exposure to the virus; their safety therefore is of paramount importance. Other persons who are at high risk of COVID–19 complications and death are the elderly, the children and other persons who have serious chronic health conditions such as heart disease, diabetes, lung cancer, asthma, ulcer, chronic respiratory infections and depression because these conditions weaken the body's health defense and immune system against viral infection (Huang, Wang, Li, Ren, Zhao, Jianping, & Hu 2020). Such persons are advised to stock up on supplies, avoid close contact with sick people, wash their hands often, stay home as much as possible in locations where COVID-19 is spreading and also develop a plan in case of illness. Another risk factor for the virus is population.

Preventive measures of COVID – 19 Pandemic

As part of the measures put forward to contain the spread of the deadly virus that has wrecked so much havoc, causing death and untold hardship, the federal government through its agency for health, has approved the following preventive measures according to (WHO, 2020), which are both to mitigate and suppress the spread of the virus:

Social distancing should be practiced. According to Health professionals, people should remain at least two meters away from other people because that is roughly as far as the virus can travel in a cough, sneeze or when someone is talking. The more people who are in an enclosed space, the higher the risk of being exposed to someone who is sick thus, there is an increased risk in larger groups. This is the reason for the closure of schools by the government and discouragement of all forms of social gatherings including religious gatherings. Regular washing of hands with soap and alcohol-based sanitizers is also necessary. Health professionals suggest washing hands after taking off facemask and gloves, if any surfaces, door handles and/or products in a store have been touched. Also, washing the masks and gloves or putting them in a high tumble dryer may also help guard against the virus.

The use of facemask is also a necessity. Face masks help prevent patients from spreading the virus, but they are not as effective as protecting the healthy (CDCP). Facemasks have helped reduce contagion by reducing droplets being sprayed into the air People are also encouraged to practice of respiratory hygiene. As part of the measures to contain the spread of the virus, the use of tissue or bent elbow while coughing and/or sneezing and disposal of the tissue have been recommended. The hands should be kept away from touching the face as much as possible.

Case isolation and disinfection should be practiced. Adding household quarantine to case isolation and social distancing is the best option to fight the pandemic. Combining all four interventions (social distancing of the entire population, case isolation, household quarantine and school and university closure) is predicted to have the largest impact, short of a complete lockdown which additionally prevents people going to work. Once interventions (such as restriction of movement) are relaxed, infections begin to rise, resulting in a predicted peak epidemic later in the year. The more successful a strategy is at temporary suppression, the larger the later epidemic is predicted to be in the absence of vaccination, due to lesser build-up of herd immunity. Li T, et al. (2020), found out that for patients with suspected infection, the following procedures have been suggested for diagnosis: performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-CoV-2 in sputum, throat swabs, and secretions of the lower respiratory tract samples.

Method

Pure descriptive survey design was used for this study. In this type of design, the researcher assessed the modes of transmission of COVID–19 among the people of South West Nigeria. The research area for this study was Lagos, Ondo, Ogun, Oyo and Ekiti states which make up the South–West geopolitical zone of Nigeria. The population of this study comprised all health personnel in South West Nigeria which include: doctors, laboratory scientists, pharmacists, nurses and midwives. A stratified sampling technique was used to select 28 respondents. The main instrument used in this study was an interview schedule through a structured questionnaire titled "*MODES OF TRANSMISSION, SIGNS, SYMPTOMS AND REMEDIES OF COVID-19 AMONG SOUTH-WEST NIGERIANS QUESTIONNAIRE (MTSSRCSWNQ)*". The reason for using the interview schedule was on the ground that the researchers needed to adopt phone calls method where the respondents were called and interviewed over the phone due to lockdown in the states that make up the region. The contacts of the respondents were made available by the Nigerian Medical Association. The instrument for the study passed through face and content validation by Medical Doctors. Cronbach Alpha technique was used to determine the level of reliability of the instrument. In the trial test, a total of 5 respondents who did not form part of the main study were randomly

selected and the questions in the interview schedule put before them on phone due to lockdown in the state. The reliability coefficient obtained was 0.84 and this was high enough to justify the use of the instrument. The data obtained was analyzed using the descriptive statistics (percentage analysis) for the research hypotheses and simple regression for hypothesis. The test for significance was done at 0.05 alpha levels.

Results and Discussion

Results

Research question 1: the research question sought to find out the extent of prevalence of COVID-19 pandemic in South West Nigeria. In order to answer the research question, percentage analysis was performed on the data (see table 1).

Table 1: Percentage Analysis of Extent of the Prevalence of Cases of COVID-19 Pandemic in South West Nigeria

PREVALENCE	Freq.	Percentage (%)
VERY HIGH EXTENT	23	82.14**
HIGH EXTENT	5	17.86*
TOTAL	**28**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**
SOURCE: Field survey

The above table 1 presents the percentage analysis of extent of the prevalence of cases of COVID-19 pandemic in South West Nigeria. From the result of the data analysis, it was observed that the highest percentage (82.14%) of the respondents affirmed that the extent of the prevalence of cases of COVID-19 pandemic in South West Nigeria is of very high extent. The least percentage (17.86%) of the respondents stated that the extent of the prevalence of cases of COVID-19 pandemic in South West Nigeria is high extent.

Research question 2: the research question sought to find out the modes of transmission of COVID-19 pandemic in South West Nigeria. In order to answer the research question, percentage analysis was performed on the data (see table 2).

Table 2: Percentage Analysis of the Modes of Transmission of Covid-19 Pandemic in South West Nigeria

MODE	Freq.	Percentage (%)
Droplet Transmission	12	42.86
Contact Transmission	14	50**
Aerosol Transmission	2	7.14*
TOTAL	**28**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**
SOURCE: Field survey

The above table 2 presents the percentage analysis of the modes of transmission of COVID-19 pandemic in South West Nigeria. From the result of the data analysis, it was observed that the respondents affirmed that contact transmission (50%) rated the highest percentage of the

mode of transmission of COVID-19 in south west Nigeria, seconded by droplet transmission (42.86%), aerosol transmission (7.14%) rated the least percentage of the mode of transmission of COVID-19 pandemic in South West Nigeria.

Research question 3: the research question sought to find out the signs and symptoms of COVID-19 infection in South West Nigeria. In order to answer the research question, percentage analysis was performed on the data (see table 3).

Table 3: Percentage Analysis of the Signs and Symptoms of COVID-19 in South West Nigeria.

SIGNS AND SYMPTOMS	Freq.	Percentage (%)
PNEUMONIA	5	20**
FEVER	5	17.14
COUGH	6	17.14
SORE THROAT	4	11.43
MYALGIA	2	8.57
FATIGUE	2	8.57
HEADACHE	2	5.71
SPUTUM PRODUCTION	1	5.71
DIARRHEA	1	2.86*
TOTAL	**28**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**
SOURCE: Field survey

The above table 3 presents the percentage analysis of the signs and symptoms of COVID-19 infection in South West Nigeria. From the result of the data analysis, it was observed that pneumonia (20%) rate the highest percentage of the signs and symptoms of COVID-19 infection, seconded by fever and cough (17.14%). This was followed by sore throat (11.43%). Myalgia and fatigue (8.57%) rated the third percentage in the group. This was followed by headache and sputum production (5.71%). While diarrhea (2.86%) rate the least percentage of the signs and symptoms of COVID-19 infection in South West Nigeria.

Research question 4: the research question sought to find out the most perceived preventive measures against COVID-19 infection in South West Nigeria. In order to answer the research question, percentage analysis was performed on the data (see table 4).

Table 4: Percentage Analysis of the Most Perceived Preventive Measures against COVID-19 Infection in South West Nigeria

MEASURE	Freq.	Percentage (%)
Wearing a medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask	10	35.71**
Maintaining social distance (a minimum of 1m) from Individuals with respiratory symptoms	5	17.85
Using PPE appropriately	7	25
Avoiding touching your eyes, nose and mouth	3	10.71
Performing hand hygiene frequently with an alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty	2	7.14
Practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue	1	3.57*
TOTAL	**28**	**100%**

**** The highest percentage frequency**

*** The least percentage frequency**

SOURCE: Field survey

The above table 4 presents percentage analysis of the most perceived preventive measures against COVID-19 infection in South West Nigeria. From the result of the data analysis, it was observed that the stated tagged "wearing a medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask" 10(35.71%) rated the highest percentage of the most perceived preventive measures against COVID-19. While "practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue" 1(3.57%) rated the least percentage of the most perceived preventive measures against COVID-19 infection in South West Nigeria.

Research Hypothesis

The null hypothesis state that there is no significant effects of COVID-19 infection on human health in South West Nigeria. In order to answer the research hypothesis, simple regression was performed on the data (see table 5).

TABLE 5: Simple Regression Analysis of the Effects of COVID-19 Infection on Human Health in South West Nigeria.

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.97[a]	0.93	0.93	0.61	0.93

***Significant at 0.05 level; df= 26; N= 28; critical R-value = 0.388**

The table shows that the calculated R-value 0.97 was greater than the critical R-value of 0.388 at 0.5 alpha level with 26 degree of freedom. The R-Square value of 0.93 predicts 93% of the effects of COVID-19 infection on human health in South West Nigeria. This rate of percentage is highly positive and therefore means that there are significant effects of COVID-19 infection on human health in South West Nigeria.

Discussion of the Findings

The result of the data analysis in table 5 and 6 was significant due to the fact that the calculated R-value 0.97 and F-342.18 were greater than the critical R-value of 0.388 at 0.05 level with 26 degree of freedom. The result implies that there is significant effect of COVID-19 infection on human health in South West Nigeria. The result therefore is in agreement with the research findings of (CDC, 2020 and Huang et al, 2020), who asserted that the effects of the COVID-19 on health of the people are as expressed in the signs and symptoms which range from symptomatic/mild symptoms to severe illness and mortality. The most commonly reported symptoms are fever, cough, myalgia or fatigue, pneumonia, and complicated dyspnea, whereas less common reported symptoms include headache, diarrhea, hemoptysis, runny nose, and phlegm-producing cough. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Conclusion

The findings of the study reveal that there is significant effect of COVID-19 pandemic on the health of people living in South West Nigeria. The preventive measures outlined above are to reduce the spread of the virus. It could be well said that it is a means to an end and not the end, therefore it should be followed judiciously.

Recommendations

1. The recommendations have been integrated in the write up. However, it is worthy to emphasize on social distancing; that is people should remain at least six feet apart from other people, whether indoors or outdoors, regarding how far spit and little droplets can fly.

2. The study also recommended that there should be continuous sensitization programmes over electronic and social media on the preventive measures of the pandemic to the citizens.

3. The study also encourages the use of face mask and strict adherence to the instructions given by government and health professionals.

4. The researcher enjoins everyone to maintain cleanliness, wash their hands regularly, keep some social distances and practice respiratory hygiene.

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