

Original research paper

Perception and practices of covid-19 in rural areas of southeastern Nigeria: a community-based cross-sectional survey

Abstract

Aims

Despite all efforts made globally by governments of various nations and all concerned agencies through preventative measures, quick testing, isolation, shutting down of societies and economy, the virus still succeeded in spreading through communities perhaps due to the wrong perspective, in addition to surveillance, prevention and management challenges. This study evaluated the perception and practices of covid-19 in rural areas of southeastern Nigeria.

Study design

The study adopted a community-based cross-sectional survey design that investigated awareness, perspective, surveillance challenges, prevention, management and economic impact in rural settlement areas of south-east, Nigeria.

Place and duration of study

This study was conducted in rural settlement areas of south-east Nigeria (Abia, Anambra, Ebonyi, Enugu, and Imo states). February – April, 2021.

Methodology

Data was collected by the use of the questionnaire. Five hundred copies were administered per state. Results

Most participants (2464, 98.6%) heard first of COVID-19 through radio/television (1409, 56.3%), social media (539, 21.5%) and their friends/relatives (418, 16.7%); 1896 (75.8%) believed in the existence of COVID-19 infection. However, the majority in Ebonyi state (309, 61.8%) had their disbelief on the existence of COVID-19. Participants confirmed having knowledge of COVID-19 testing (2319, 92.8%) and isolation centers (2299, 92.0%), however, a major challenge was lack of

(1698, 67.9%) or no awareness (550, 22.0%) of masses testing centre in their areas. A few individuals (392, 15.7%) reported having experienced one or two COVID-19 symptoms about 3 months ago. Knowledge on how to prevent contracting COVID-19 is relatively high (66.7%) among the respondents. COVID-19 induced economic burden amongst residents were mainly as a result of the imposition of lockdown to movements and businesses (1098, 43.9%), disruption of studies (959, 38.4%), increased hunger (950, 38.0%), high expenditure (894, 35.8%) and loss of job/income (816, 32.6%).

Conclusion

It is concluded that the majority of the people in southeast Nigeria are aware of the possible existence of Covid-19 in their area.

Keywords: COVID-19, Economic impact, Perception, Practices, Rural areas, South-East Nigeria

Introduction

Coronavirus disease 2019 (COVID-19) pandemic has been declared a new disease, separate from other diseases caused by coronaviruses [severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS)] (WHO, 2020). Currently, the total confirmed cases of Covid-19 have reached over 220,697,522 with more than 4,567,506 deaths and over 198,072,562 recoveries globally (Johns Hopkins Coronavirus Resource Center, 2021). COVID-19 pandemic has directly and indirectly affected every individual, family, community, and society across the world. It has altered daily lives, recessed economies of nations, disrupted the chain of socioeconomic relations, exposed the poor health care systems in many nations, induced fears globally, and has exerted indefinable hardship globally because societies and economies were placed on hold in order to curtail the ability of the virus to spread through communities. Its impacts have led to severe and widespread increases in global food insecurity, affecting vulnerable households in almost every country, with impacts expected to continue through 2021, into 2022, and possibly beyond as the Delta variant continues its spread.

Researchers have documented reports on awareness, perception and the practice of COVID-19 prevention among residents of a state in the South-South region of Nigeria. Owghonda et al. (2021) reported that the most common sources of information about COVID-19 were radio jingles and television adverts. Most respondents had poor knowledge of COVID-19. Some respondents believed they were unlikely to contract the virus. Only a few of the respondents washed all the critical parts of their hands

correctly. Adebowale et al. (2021) in a study on SARS-CoV-2 (COVID-19 pandemic) in Nigeria: Multi-institutional survey of knowledge, practices, and perception amongst undergraduate veterinary medical students reported that respondents' mean knowledge and practice scores were 22.7 (SD \pm 3.0) and 24.1 (SD \pm 2.9), respectively with overall 63.4% and 88.8% displaying good knowledge and satisfactory practice levels. However, relatively lower proportions showed adherence to avoiding touching face or nose (19.5%), face mask-wearing (58.1%), and social distancing (57.4%). Al-Hanawi et al. (2020) on a study Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study documented that majority of the study participants were knowledgeable about COVID-19, had indicating optimistic attitudes, showed good practices; men have less knowledge, less optimistic attitudes, and less good practice toward COVID-19 than women. They also found that older adults are likely to have better knowledge and practices, than younger people.

Despite all efforts made globally by governments of various nations and all concerned agencies through preventative measures, quick testing, isolation, shutting down of societies and economy, the virus still succeeded in spreading through communities perhaps due to the wrong perspective, in addition to surveillance, prevention, and management challenges.

Nations including Nigeria have reopening economy with caution and fear of possible resurging of the virus infection. Nigeria Centre for Disease Control (NCDC) recently reported a total of 195,511 confirmed cases of COVID-19 out of which there 8,430 active cases, 184,529 discharged cases, 2,552 deaths. So far, out of over 200, 000 000 million population of Nigerians only 2,779,725 samples have been tested (NCDC, 2021). In Nigeria, it appears some people are yet to accept that viral infection exists in the country. This disbelief could greatly stifle any control effort employed. It is necessary to ascertain the level of COVID-19 awareness of the general population to facilitate control efforts.

The present study was conducted in rural settlements of southeast region of Nigeria. The region is made up of five states Abia, Anambra, Ebonyi, Enugu and Imo. The residents of the rural areas are dominant of the Igbo-speaking tribe, mainly rural farmers, traders, fishermen, artisans, and civil servants. It was discovered that most interior villages\communities in our study area people live together and share things in common. Specifically, they farm, bath in the same stream, share densely populated market, prefer eating together from same plate, etc. as a way of life. Consequently, even with the coming of COVID-19, they find it difficult to adjust. Many of them do not believe that the disease is real. Health care

facilities in many villages are in a bad state. Considering the current low physician/patient ratio of 1: 2500 in Nigeria, an outburst of COVID-19 in rural settlements will expose the country's poor health care system and endanger many lives. Iaccarino (2019) stated that the propensity for disease transmission is higher among the people that live in close proximity. Basically, higher population could spur challenges in sanitation and declined quality of living conditions and potentially serves as a breeding venue for infectious agents and rapid transmission.

This study was prompted by an observed high level of the wrong perception of COVID-19 amongst the inhabitants of our chosen study area, surveillance, prevention and management challenges. There is also a dearth of literature on perspective, surveillance challenges, prevention, management and economic impact of COVID-19 in rural settlement areas of south-east, Nigeria. The present study was designed to investigate the perspective, surveillance challenges, prevention, management and economic impact of COVID-19 in rural settlement areas of south-east, Nigeria.

Materials and Methods

Study Area

This study was conducted in rural settlement areas of southeast Nigeria (Abia, Anambra, Ebonyi, Enugu, and Imo states).

Study Design, Population, and Informed Consent

The study adopted a community-based cross-sectional survey design that investigated awareness, perspective, surveillance challenges, prevention, management, and economic impact in rural settlement areas of south-east, Nigeria. All the needed data were obtained using a structured questionnaire, which was administered to the respondents across the states for a period of 3 months (February – April, 2021).

The study population was all adults in the five south-eastern states of Nigeria. The participants were recruited with the assistance of fellow academic staff colleagues from involved states (Abia, Anambra, Ebonyi, Enugu, and Imo states). The sample size for the study was calculated using Kasiulevicius *et al.* (2006) formula, and a total of 2,500 participants from the five states were randomly

sampled, after being briefed on the purpose of the study for informed consent, and their confidentiality were assured.

Data Collection

Data were collected with a questionnaire. Five hundred (500) copies of a structured questionnaire containing information on the socio-demographic characteristic of the respondents, community awareness and perspective on COVID-19, challenges to community surveillance on covid-19 and prevention, management, and impact of COVID-19 were administered to respondents randomly from each of the five states that make up south-eastern Nigeria.

Statistical Analysis

The data collected from the investigation were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 (IBM Corporation, Armonk, USA). Descriptive statistics of mean, frequencies, and percentages were used to compare the studied parameters in the various states. Results were presented in tables.

Results

Table 1 shows the socio-demographic characteristics of respondents in the study area. The males were slightly greater in preponderance (1419, 56.8%) than the females (1081, 43.2%), as observed in all the states except for Ebonyi with higher female respondents (254, 50.8%) than males (246, 49.2%). The age mean value of the respondents is 31.99 ± 9.76 , with the majority of them being 30 years old. Overall marital status of the respondents showed that single individuals (1206, 48.2%) were higher among residents that gave consent to participate in the study, followed by the married (1154, 46.2%). This is however true for Ebonyi, Enugu, and Imo states, but not for Abia and Anambra states with higher consented participants among the married individuals (Table 1). A greater preponderant of the participants had tertiary and secondary level education with 1079 (43.1%) and 999 (40.0%) values respectively. A total of 814 (32.6%) and 748 (29.9%) of the participants are self-employed and salary-employed respectively. Others are mainly students (590, 23.6%) and farmers (306, 12.2%) with very few jobless individuals (42, 1.7%). Christianity is the religion of practice for most of the participants (2302, 92.1%). Participants from Abia and Anambra states recorded 100% practice of Christian religion, while Ebonyi had 84

138 (16.8%) and 35 (7.0%) of the respondents as Muslims and atheists respectively. Also, individuals that practice
 139 African traditional religion were observed in Ebonyi (51, 10.2%), Enugu (15, 3.0%) and Imo (13, 2.6%).

140 **Table 1. Socio-demographic characteristics of respondents in South-East Nigeria**

Parameter	Variables	States					Total
		Abia	Anambra	Ebonyi	Enugu	Imo	
Sex	Male	279 (55.8)	281 (56.2)	246 (49.2)	306 (61.2)	307 (61.4)	1419 (56.8)
	Female	221 (44.2)	219 (43.8)	254 (50.8)	194 (38.8)	193 (38.6)	1081 (43.2)
Age	Mean \pm SD	31.92 \pm 6.1	32.20 \pm 7.98	31.58 \pm 9.69	32.11 \pm 12.52	32.12 \pm 12.49	31.99 \pm 9.76
	Mode	32	32	30	30	30	30
Marital status	Single	144 (28.8)	164 (32.8)	298 (59.6)	301 (60.2)	299 (59.8)	1206 (48.2)
	Married	300 (60.0)	291 (58.2)	195 (39.0)	184 (36.8)	184 (36.8)	1154 (46.2)
	Divorced	35 (7.0)	28 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	63 (2.5)
	Widowed	21 (4.2)	17 (3.4)	7 (1.4)	15 (3.0)	17 (3.4)	77 (3.1)
Educational level	None	6 (1.2)	3 (6.0)	71 (14.2)	0 (0.0)	0 (0.0)	80 (3.2)
	Primary	82 (16.4)	72 (14.4)	154 (30.8)	18 (3.6)	16 (3.2)	342 (13.7)
	Secondary	288 (57.6)	297 (59.4)	95 (19.0)	156 (31.2)	163 (32.6)	999 (40.0)
	Tertiary	124 (24.8)	128 (25.6)	180 (36.0)	326 (65.2)	321 (64.2)	1079 (43.1)
Occupation	None	0 (0.0)	0 (0.0)	10 (2.0)	16 (3.2)	16 (3.2)	42 (1.7)
	Salary-employed	159 (31.8)	184 (36.8)	114 (22.8)	145 (29.0)	146 (29.2)	748 (29.9)
	Self-employed	182 (36.4)	170 (34.0)	198 (39.6)	135 (27.0)	129 (25.6)	814 (32.6)
	Farming	89 (17.8)	78 (15.6)	77 (15.4)	30 (6.0)	32 (6.4)	306 (12.2)
	Student	70 (14.0)	68 (13.6)	101 (20.2)	174 (34.8)	177 (35.4)	590 (23.6)

Religion	None	0 (0.0)	0 (0.0)	35 (7.0)	0 (0.0)	0 (0.0)	35 (1.4)
	Christianity	500 (100.0)	500 (100.0)	330 (66.0)	485 (97.0)	487 (97.4)	2302 (92.1)
	Islam	0 (0.0)	0 (0.0)	84 (16.8)	0 (0.0)	0 (0.0)	84 (3.4)
	Traditional	0 (0.0)	0 (0.0)	51 (10.2)	15 (3.0)	13 (2.6)	79 (3.1)

141 Values are expressed as the frequency with percentages in parenthesis, n (%), whereas age is
 142 expressed as Mean \pm SD.

143
 144
 145 Table 2 shows the community awareness and perspective on COVID-19 among residents in the
 146 study area. It was observed that most of the participants (2464, 98.6%) heard of COVID-19 through
 147 radio/television (1409, 56.3%), social media (539, 21.5%) and their friends/relatives (418, 16.7%). Apart
 148 from awareness through radio/television, participants in Abia and Anambra that reported they first heard
 149 of COVID-19 through friends/relatives, were higher than those first heard through social media (Table 2).
 150 Health campaigns (87, 3.5%) and religious Centres like churches or mosques (49, 2.0%) were the least
 151 sources that the participants first heard of COVID-19. In all the states, overall, of 2181 (87.2%) of the
 152 respondents attested being aware of the COVID-19 symptoms and believed that elderly people (2184,
 153 87.4%) are most prone to its infection. On the existence of COVID-19 in Nigeria and the study area
 154 (South East), a greater preponderant of the participants (1897, 75.9%) and (1896, 75.8%) respectively
 155 believed its existence. However, it was observed that in Ebonyi state, the majority of the participants had
 156 their disbelief on the existence of COVID-19 both in Nigeria and in their state (309, 61.8%).

157
 158 **Table 2. Community awareness and perspective on COVID-19 among residents in South-**
 159 **East Nigeria**

Variables	States					Total
	Abia	Anambra	Ebonyi	Enugu	Imo	
Heard of COVID-19?						
Yes	494 (98.8)	495 (99.0)	493 (98.6)	493 (98.6)	489 (97.8)	2464 (98.6)
No	6 (1.2)	5 (1.0)	7 (1.4)	7 (1.4)	11 (2.2)	36 (1.4)

Source you first heard?

Radio/TV	308 (61.6)	292 (58.4)	278 (55.6)	278 (55.6)	253 (50.6)	1409 (56.3)
Health campaigns	18 (3.6)	20 (4.0)	15 (3.0)	15 (3.0)	19 (3.8)	87 (3.5)
Social media	74 (14.8)	85 (17.6)	121 (24.2)	120 (24.0)	139 (27.4)	539 (21.5)
Church/mosque	12 (2.4)	10 (2.0)	9 (1.8)	9 (1.8)	9 (1.8)	49 (2.0)
Friends/relatives	88 (17.6)	93 (18.6)	77 (15.4)	78 (15.6)	82 (16.4)	418 (16.7)

Aware of COVID-19 symptoms?

Yes	459 (91.8)	486 (97.2)	400 (80.0)	399 (79.8)	437 (87.4)	2181 (87.2)
No	41 (8.2)	14 (2.8)	100 (20.0)	101 (20.2)	63 (12.6)	319 (12.8)

Are people most prone to COVID-19?

Children	0 (0.0)	0 (0.0)	29 (5.8)	30 (6.0)	35 (7.0)	94 (3.7)
Adolescents	72 (14.4)	66 (13.2)	31 (6.2)	28 (5.6)	25 (5.0)	222 (8.9)
Elderly people	428 (55.6)	434 (86.8)	440 (88.0)	442 (88.4)	440 (88.0)	2184 (87.4)

Existence of covid-19 in Nigeria?

Yes	420 (84.0)	449 (89.8)	191 (38.2)	419 (83.8)	418 (83.6)	1897 (75.9)
No	80 (16.0)	51 (10.2)	309 (61.8)	81 (16.2)	82 (16.4)	603 (24.1)

Existence of covid-19 in your state?

Yes	420 (84.0)	449 (89.8)	191 (38.2)	419 (83.8)	417 (83.4)	1896 (75.8)
No	80 (16.0)	51 (10.2)	309 (61.8)	81 (16.2)	83 (16.6)	604 (24.2)

160 Values expressed as the frequency with percentages in parenthesis, n (%).

161

162 Table 3 shows the challenges to community surveillance on COVID-19 among residents in the

163 study area. The majority of the residents confirmed the presence of centers in their states for COVID-19

164 testing (2319, 92.8%) and isolation (2299, 92.0%) for individuals. Also, the preferred care-seeking option
 165 for COVID-19 is a hospital-based intervention for most of the participants (1826, 73.0%). There were
 166 more or less few masses testing for COVID-19 in the study area as the majority of the respondents
 167 reported none (1698, 67.9%), others don't know (550, 22.0%), with just few individuals (252, 10.1%) that
 168 attested to testing programme in their states (Table 3). The residents' awareness of and contact to NCDC
 169 are high, as the majority of them have heard (2197, 87.9%) and have contact (2135, 85.4%) to NCDC.
 170 Further, many of the residents don't know nor believe that there are COVID-19 positive (53.0%, 44.7%)
 171 and death (61.7%, 34.1%) cases in their states respectively (Table 3). Greater preponderant (2397,
 172 95.9%) of the participants envisaged possible challenges to COVID-19 community testing compliance
 173 and claimed that there exists palpable stigma associated with COVID-19 infection in their states (2253,
 174 90.1%).

175
 176
 177 **Table 3. Challenges to community surveillance on COVID-19 among residents in South-**
 178 **East Nigeria**

178

East Nigeria

Variables	States					Total
	Abia	Anambra	Ebonyi	Enugu	Imo	
COVID-19 testing centre close-by?						
Yes	500 (100.0)	500 (100.0)	319 (63.8)	500 (100.0)	500 (100.0)	2319 (92.8)
No	0 (0.0)	0 (0.0)	181 (36.2)	0 (0.0)	0 (0.0)	181 (7.2)
COVID-19 isolation centre close-by?						
Yes	488 (97.6)	489 (97.8)	344 (68.8)	489 (97.8)	489 (97.8)	2299 (92.0)
No	12 (2.4)	11 (2.2)	156 (31.2)	11 (2.2)	11 (2.2)	201 (8.0)
Care-seeking preference for COVID?						
Traditional	99 (19.8)	97 (19.4)	190 (38.0)	155 (31.0)	108 (21.6)	649 (26.0)
Hospital	395 (79.0)	402 (80.4)	298 (59.6)	345 (69.0)	386 (77.2)	1826 (73.0)
Religion	6 (1.2)	1 (0.2)	12 (2.4)	0 (0.0)	6 (1.2)	25 (1.0)

Mass testing for COVID in your area?

Yes	81 (16.2)	140 (28.0)	29 (5.8)	0 (0.0)	2 (0.4)	252 (10.1)
No	371 (74.2)	357 (71.4)	466 (93.2)	252 (50.4)	252 (50.4)	1698 (67.9)
Don't know	48 (9.6)	3 (0.6)	5 (1.0)	248 (49.6)	246 (49.2)	550 (22.0)

Heard of NCDC?

Yes	480 (96.0)	477 (95.4)	282 (56.4)	481 (96.2)	477 (95.4)	2197 (87.9)
No	20 (4.0)	23 (4.6)	218 (43.6)	19 (3.8)	23 (4.6)	303 (12.1)

Contacts/accessibility to NCDC?

Yes	454 (90.8)	451 (90.2)	325 (65.0)	454 (90.8)	451 (90.2)	2135 (85.4)
No	46 (9.2)	49 (9.8)	175 (35.0)	46 (9.2)	49 (9.8)	365 (14.6)

COVID-19 positive cases in your area?

Yes	16 (3.2)	5 (1.0)	15 (3.0)	16 (3.2)	5 (1.0)	57 (2.3)
No	187 (37.4)	179 (35.8)	386 (77.2)	187 (37.4)	180 (36.0)	1119 (44.7)
Don't know	297 (59.4)	316 (63.2)	99 (19.8)	297 (59.4)	315 (63.0)	1324 (53.0)

COVID-19 death cases in your area?

Yes	15 (3.0)	30 (6.0)	18 (3.6)	14 (2.8)	29 (5.8)	106 (4.2)
No	95 (19.0)	139 (27.8)	383 (76.6)	95 (19.0)	140 (28.0)	852 (34.1)
Don't know	390 (78.0)	331 (66.2)	99 (19.8)	391 (78.2)	331 (66.2)	1542 (61.7)

Any challenges to COVID-19 testing?

Yes	494 (98.8)	497 (99.4)	415 (93.0)	494 (98.8)	497 (99.4)	2397 (95.9)
No	6 (1.2)	3 (0.6)	35 (7.0)	6 (1.2)	3 (0.6)	53 (2.1)

Any COVID-19 associated stigma?

Yes	486 (97.2)	478 (95.6)	325 (65.0)	486 (97.2)	478 (95.6)	2253 (90.1)
No	14 (2.8)	22 (4.4)	175 (35.0)	14 (2.8)	22 (4.4)	247 (9.9)

179 Values expressed as frequency with percentages in parenthesis, n (%).

180

181 Table 4 shows the prevention practices of COVID-19 among residents in the study area. from the

182 result, symptoms like high fever (1213, 48.5%), breathing difficulty (1097, 43.9%) and dry cough (949,

183 38.0%) were the most notable. Others include catarrh (670, 26.8%) and weakness (726, 29.0%). Few

184 individuals reported having experienced any of the COVID-19 symptoms about 3 months ago (392,

185 15.7%). Knowledge on how to prevent contracting COVID-19 is relatively high among the respondents

186 with an overall of 1667 (66.7%) residents that claimed they have knowledge on COVID-19 prevention

187 practices. Preventive measures like regular hand washing with soap (1807, 72.3%), hand sanitizing (1030,

188 41.2%), use of face mask (817, 32.7%), and sneezing into elbow (720, 28.8%), among others, are the

189 most practiced measures among the residents (Table 4). It is noteworthy also that most of the respondents

190 (2135, 85.4%) reported that they have not seen any COVID-19 patient before.

191

192 **Table 4. Prevention practices of COVID-19 among residents in South-East Nigeria**

Variables	States					Total
	Abia	Anambra	Ebonyi	Enugu	Imo	
COVID-19 infection symptoms?						
High fever	115 (23.0)	114 (22.8)	323 (64.6)	327 (65.4)	334 (66.8)	1213 (48.5)
Breathing difficulty	128 (25.5)	139 (27.8)	217 (43.4)	303 (60.6)	310 (62.0)	1097 (43.9)
Dry cough	66 (13.2)	54 (10.8)	220 (44.0)	301 (60.2)	308 (61.6)	949 (38.0)
Catarrh	102 (20.4)	99 (19.8)	114 (22.8)	176 (35.2)	179 (35.8)	670 (26.8)
Weakness	81 (16.2)	72 (14.4)	153 (30.6)	205 (41.0)	215 (43.0)	726 (29.0)
All of the above	207 (41.3)	203 (40.6)	149 (29.8)	223 (44.6)	218 (43.6)	1000 (40.0)
Don't know	129 (25.7)	121 (24.2)	108 (21.6)	16 (3.2)	15 (3.0)	389 (15.6)

Experienced any above in last 3 months?

Yes	48 (9.6)	26 (5.2)	70 (14.0)	40 (8.0)	208 (41.6)	392 (15.7)
No	452 (90.4)	474 (94.8)	430 (86.0)	460 (92.0)	292 (58.4)	2108 (84.3)

Know how to prevent COVID-19?

Yes	338 (67.6)	288 (57.6)	389 (77.8)	382 (76.4)	270 (54.0)	1667 (66.7)
No	162 (32.4)	212 (42.4)	111 (22.2)	118 (23.6)	230 (46.0)	833 (33.3)

COVID preventive measures practiced?

Hand wash with soap	484 (96.6)	486 (97.2)	280 (56.0)	275 (55.0)	282 (56.4)	1807 (72.3)
Hand sanitizing	69 (13.8)	65 (13.0)	369 (73.8)	259 (51.8)	268 (53.8)	1030 (41.2)
Face mask use	20 (4.0)	14 (2.8)	118 (23.6)	330 (66.0)	335 (67.0)	817 (32.7)
Sneezing into elbow	68 (13.6)	66 (13.2)	158 (31.6)	211 (42.2)	217 (43.4)	720 (28.8)
Social distancing	45 (9.0)	41 (8.2)	143 (28.6)	241 (48.2)	247 (49.4)	717 (28.7)
Avoiding crowds	60 (12.0)	57 (11.4)	107 (21.4)	238 (47.6)	248 (49.6)	710 (28.4)
Non-shake of hands	55 (11.0)	49 (9.8)	39 (7.8)	152 (30.4)	162 (32.4)	457 (18.3)
Taking supplements	40 (8.0)	36 (7.2)	50 (10.0)	29 (5.8)	31 (6.2)	186 (7.4)
Avoiding the sick	21 (4.2)	21 (4.2)	52 (10.4)	56 (11.2)	61 (12.2)	211 (8.4)
All of the above	25 (5.0)	28 (5.6)	19 (3.8)	81 (16.2)	74 (14.8)	227 (9.1)

Seen COVID-19 patient before?

Yes	41 (8.2)	48 (9.6)	24 (4.8)	24 (4.8)	228 (45.6)	365 (14.6)
No	459 (91.8)	452 (90.4)	476 (95.2)	476 (95.2)	272 (54.4)	2135 (85.4)

193 Values expressed as frequency with percentages in parenthesis, n (%).

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Table 5 shows the management strategies and impact of COVID-19 among residents in the study area. Knowledge of treatment for COVID-19 is low among the residents (274, 11.0%). However, most of them reported that they are aware of some treatment options practiced elsewhere like taking of malaria drugs (809, 32.4%), going to the hospital (753, 30.1%), herbal concoctions (406, 16.2%), and food supplements (343, 13.7%), among others. The overall efforts of NCDC and other health workers were rated high by the majority of the residents (1267, 50.7%), especially from Ebonyi, Enugu, and Imo states, whereas Abia and Anambra residents rated their efforts as mainly low and moderate (Table 5). The economic burden due to COVID-19 among the residents was mainly a result of the imposition of lockdown to movements and businesses (1098, 43.9%). Others are disruption of studies (959, 38.4%), increased hunger (950, 38.0%), high expenditure (894, 35.8%) and loss of job/income (816, 32.6%). The majority of the residents across states (1944, 77.7%) complained of the high economic impact of COVID-19, with few individuals that rated the impact to be rather moderate (424, 17.0%) and low (132, 5.3%).

Table 5. Management strategies and impact of COVID-19 among residents in South-East Nigeria

Nigeria						
Variables	States					Total
	Abia	Anambra	Ebonyi	Enugu	Imo	
Know the treatment of COVID-19?						
Yes	44 (8.8)	62 (12.4)	61 (12.2)	61 (12.2)	46 (9.2)	274 (11.0)
No	456 (91.2)	438 (87.6)	439 (87.8)	439 (87.8)	454 (90.8)	2226 (89.0)
Treatment options aware of/practiced?						
Herbal concoction	34 (6.8)	30 (6.0)	261 (52.2)	42 (8.4)	39 (7.8)	406 (16.2)
Food supplements	11 (2.2)	12 (2.4)	218 (43.6)	51 (10.2)	51 (10.2)	343 (13.7)
Tradition practitioner	8 (1.6)	12 (2.4)	30 (6.0)	26 (5.2)	24 (4.8)	100 (4.0)

Local store drugs	33 (6.6)	27 (5.4)	43 (8.6)	64 (12.8)	65 (13.0)	232 (9.3)
Going to hospital	124 (24.8)	133 (26.6)	110 (22.0)	194 (38.8)	192 (38.4)	753 (30.1)
Hot fluids with spices	67 (13.4)	77 (15.4)	31 (6.2)	38 (7.6)	37 (7.4)	250 (10.0)
Taking malaria drugs	296 (59.1)	310 (62.0)	89 (17.8)	57 (11.4)	57 (11.4)	809 (32.4)
Rate efforts of NCDC/health workers?						
Low	280 (56.0)	280 (56.0)	5 (1.0)	5 (1.0)	21 (4.2)	591 (23.6)
Moderate	197 (39.4)	203 (40.6)	87 (17.4)	88 (17.6)	67 (13.4)	642 (25.7)
High	23 (4.6)	17 (3.4)	408 (81.6)	407 (81.4)	412 (82.4)	1267 (50.7)
How has COVID-19 been a burden?						
Lockdown imposition	101 (20.2)	92 (18.4)	300 (60.0)	303 (60.6)	302 (60.4)	1098 (43.9)
Loss of job/income	189 (37.7)	176 (35.2)	111 (22.2)	168 (33.6)	172 (34.4)	816 (32.6)
Increased hunger	164 (32.7)	154 (30.8)	167 (33.4)	230 (46.0)	235 (47.0)	950 (38.0)
Disruption of studies	168 (33.5)	166 (33.2)	204 (40.8)	206 (41.2)	215 (43.0)	959 (38.4)
High expenditure	157 (37.0)	185 (37.0)	171 (34.2)	191 (38.2)	190 (38.0)	894 (35.8)
Rate the COVID-19 economic impact?						
Low	7 (1.4)	13 (2.6)	4 (0.8)	4 (0.8)	104 (20.8)	132 (5.3)
Moderate	4 (0.8)	7 (1.4)	171 (34.2)	155 (31.0)	87 (17.4)	424 (17.0)
High	489 (97.8)	480 (96.0)	325 (65.0)	341 (68.2)	309 (61.8)	1944 (77.7)

214 Values expressed as frequency with percentages in parenthesis, n (%).

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216

217 Discussions

218 This study evaluated issues on Covid-19 disease awareness, perspective, surveillance challenges,
 219 prevention, management and economic impact in rural settlement areas of the southeast, Nigeria.

220 Considering the fact that Nigeria is the largest and most densely populated country in Africa and the 7th

largest population in the world, with approximately 200 million people on a landmass area of 920,000km (360,000 sq mi), having approximately more than 60% of its population as urban dwellers, and the urbanization rate is estimated at 4.3%, over 60% are younger than 25 years and the aged population is only 3.3% (Central Intelligence Agency, 2020). It is obvious that a lesser portion of its population settles in the rural areas and a lesser proportion also fall within the very old ages which are more prone to the COVID-19 scourge. Ibrahim (2020) reported that timely and accurate of surveillance data is an essential element for effective Covid-19 interventions. Surveillance is a cornerstone for controlling the Covid-19 pandemic. Enhancing Covid-19 surveillance is vital for rapid cases detection, containing spread & ending pandemic.

The socio-demographic characteristics of respondents in this study showed an age mean value of the respondents is 31.99 ± 9.76 (with majority of them being 30 years old). A greater number of them are self-employed including farmers and students. These findings are consonants with CIA (2020). The population are majorly Christians with a little fraction of that practice African traditional religion. It will be important to also note that our researchers targeted a population that would be able to fill our instrument for data collection properly.

It was observed that most of the participants heard of COVID-19 through the media mainly radio/television. Most rural areas in our study area do not have access to a weak network, some do not have access at all. Consequently, most of them rely on radio\television as the mass media through which they receive information. On the other hand, only few of the respondents admitted that they first heard of COVID-19 through a health campaign. This reflects the level of negligence rural settlement arears suffer in Nigeria especially southeast Nigeria. Most times, health workers decline to work in the rural areas because some of the locations do not have access roads and most health facilities in rural areas are in a deteriorating state. Specifically, at the heat of COVID-19 in Nigeria, safety gadgets were not dispatched to health facilities in rural areas. These findings are consonants with Amoo *et al.*, (2020), Etukudoh *et al.*, (2020) and Obeta *et al.*, (2020).

The majority believed that elderly people are most prone to COVID-19 infection in our study area. They also believed in the possible existence of COVID-19 in Nigeria and southeast Nigeria. However, it was observed that in Ebonyi state, the majority of the participants had a wrong perspective because they

expressed disbelief on the existence of COVID-19 both in Nigeria and in their state. Some of them stated that politicians are deceiving them by preaching about a disease that is not in existence.

Some respondents confirmed knowledge of COVID-19 testing centers in their states and isolation for COVID-19 patients. They also confirmed non-mass testing for COVID-19 in their areas. In line with the above finding, it is important that note that there is only one Federal government-established sponsored COVID-19 testing center in entire southeast Nigeria. Obeta *et al.* (2020) reported that the laboratory sites according to geopolitical zones are South West: 7 laboratories (Lagos, Ibadan, Ogun and Osun); South-South: 1 laboratory (Edo); southeast: 1 laboratory (Ebonyi); North Central/ FCT: 3 laboratories (Abuja, Jos); North West: 5 laboratories (Sokoto, Kano and Kaduna); and North East: 1 laboratory (Maiduguri). Therefore, it is long overdue for the Nigerian government through NCDC to establish laboratories capable of handling COVID-19 and another disease testing in all states.

They confirmed having NCDC's contact sent to them through various service providers. Further, many of the residents don't know nor believe that there are COVID-19 positive patients and death cases in their states respectively. A greater preponderant of the participants envisaged possible challenges to COVID-19 community testing compliance, and claimed that there exists palpable stigma associated with COVID-19 infection in their states. These findings were in line with Amoo *et al.* (2020) and Etukudoh *et al.* (2020).

Knowledge of treatment for COVID-19 was low among the residents. Some responded that they preferred a care-seeking option for COVID-19 is hospital-based intervention if need be while others prefer treating with herbs used for malaria treatment and fruits found within their area. This collaborates with Nkereuwem *et al.*, (2020) who stated that the Presidential Task Force, the NCDC and NAFDAC in collaboration with CDC and WHO should look into the use of indigenous products that could help in the management of COVID-19. Such should include herbs e.g., "Dogon yaro", and Nigerian food like vegetables and fruits – lemon, bitter cola, ginger, garlic, etc. Bitterly, some of residents rightly shared with us that COVID-19 cannot survive in their body because they often take alcohol. By implication that the alcohol will always dry and kill the virus causing COVID-19.

The respondents confessed that economic burden caused by COVID-19 within our study areas were mainly as a result of the imposition of lockdown to movements and businesses, disruption of studies, increased hunger, high expenditure and loss of job/income. Majority of the residents across states complained of high economic impact of COVID-19. The lockdown was unavoidable because SARS-COV-2 has shown quick and easier transmission among the clusters, for example: family clusters, board room clusters, restaurant clusters etc. which has accounted for 50-80% of all confirmed cases of COVID-19 (Special Expert Group for Control of the Epidemic of Novel Coronavirus Pneumonia of the Chinese Preventive Medicine Association, 2020).

Conclusion

The present study revealed that most participants have heard and also believe that COVID-19 exists in southeast Nigeria. Participants confirmed that there is a major challenge regards to lack or no awareness of the masses testing center in their areas. Knowledge on how to prevent contracting COVID-19 is relatively high among the respondents. COVID-19 induced economic burden amongst residents were mainly as a result of the imposition of lockdown to movements and businesses, disruption of studies, increased hunger, high expenditure, and loss of job/income.

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the authors.

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Authors' contributions

EIN, OCA, LCO, GCN, OAO, provided all the materials used for this study. EIN designed this research. EIN, OCA, LCO, GCN, OAO, PNI, CPO, CLA and CFE were responsible for the field work, handled monitored the process of data collection, statistical analysis and result interpretation. The manuscript was prepared by EIN and edited by all authors. The final version was read and approved by all authors. All authors agree to be accountable for all aspects of this manuscript in ensuring that any questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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