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COVID-19: Knowledge, perceptions and attitudes of residents in the Northern Region of Ghana, West Africa

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Abstract

Africa is gradually becoming an epicentre for the COVID-19 pandemic. From the current trends of the disease, Africa might be the last hardest hit continent. While scientific investigations are ongoing to develop effective management through medications and vaccines, existing knowledge, perceptions and attitudes could be harnessed to develop an effective strategy to curb community transmission of the COVID-19. The present study assessed the awareness level, perceptions and attitudes of people living in rural, peri-urban and urban communities in Northern Ghana and their preparedness for the prevention and containment of COVID-19. We conducted a face-to-face interview and administered 553 semi-structured questionnaires in eighteen (18) rural and peri-urban/urban communities under Tolon District, Kumbungu Districts, Sagnarigu Municipality, Savelugu Municipality and Tamale Metropolis from 23rd of April to 8th of June 2020. The percentage of male to female among the respondents was 56.8% and 43.2%, respectively. Nearly half (41%) of the respondents had no formal education and 91.3% of them were Muslims. Most of the respondents (85%) held the view that COVID-19 is a punishment from God. There was a significant difference ($P<0.05$) between the time rural and peri-urban/urban communities first heard of COVID-19. Majority (63%) of the rural respondents depended on radio, while the peri-urban/urban respondents (51%) relied on television for information on COVID-19. All respondents were aware of COVID-19 and 91.7% could mention at least two symptoms of the disease but 18% believed there was no COVID-19 in Ghana. Most of the respondents (69.6%) believed they will not contract the virus. Our findings may provide useful data to government and other stakeholders in the COVID-19 fight**.**

Keywords: COVID-19, knowledge, perception, attitude, Northern Region, Ghana

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Introduction

The world has been bedeviled with the COVID-19 pandemic since March, 2020 (WHO, 2020). Since its outbreak, there have been lots of misperceptions and false information about the disease. The first misconception among Africans was the fact that the SARS-CoV-2 was susceptible to the high temperatures of the tropics and thus, Africans will be free from this disease. The access to information by the various groups in society is key to preventing and managing the COVID-19. It has been recommended that authentic information on the COVID-19 is sought from official websites of health authorities due to myriads of false information flooding the internet (Hernández-García and Giménez-Júlvez, 2020). However, most rural communities have no or limited access to the internet in Ghana. Furthermore, rural communities do not have the means to solicit for information on the prevention and containment of the disease, or to pose questions about the disease to be better informed. Other studies have confirmed the same phenomenon among indigenous population in Mexico, South America (Díaz de León-Martínez et al., 2020).

Low awareness and perceptions of diseases among the population is known to negatively impact preventive measures (Ajayi et al., 2019; Ananga et al., 2017), which may influence early detection and acceptability to test for the SARS-CoV-2. Moreover, culture and religious beliefs of the people may also play a crucial role in accepting preventive measures taken to curb the spread of diseases (Spittel, Maier, and Kraus, 2019). Since the first detection of the disease in Ghana, there have been several efforts by the government, the private sector, communities and individuals to support the less privileged in society. However, conscious efforts have not been made to evaluate how different groups of citizens (rural, peri urban and urban dwellers) are coping with the proposed measures to prevent the disease. Several studies that sought to investigate the awareness, perceptions and attitudes of rural dwellers towards

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diseases have proven to be useful for this study (Merga and Alemayehu 2015; Mtuy et al. 2019; Workneh et al., 2018).

In our quest to contribute to baseline data on COVID-19 in the Northern region of Ghana, we conducted a face to face interviews and administered 553 semi-structured questionnaires in eighteen (18) rural and peri-urban/urban communities under Tolon District, Kumbungu Districts, Sagnarigu Municipality, Savelugu Municipality and the Tamale Metropolis. Our aim was to report on the awareness level, perceptions and attitudes of people living in rural, peri-urban and urban communities and their preparedness for the prevention and containment of the COVID-19. We also sought to compare the level of awareness, perception and attitudes of rural communities to the peri-urban and urban communities.

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Materials and methods

Consents from respondents

All the respondents in this study consented to provide information for the research. The respondents were assured that their responses will be treated as confidential and used for research purposes only.

Study Area

The respondents interviewed for this study were randomly selected from eighteen communities in five different districts of the Northern Region of Ghana, namely, Tolon district, Kumbungu district, Sagnarigu municipality, Savelugu municipality, and the Tamale metropolis. The Northern Region is the most populated region in the northern part of the country with a population of 1,905,628 in 14 districts. (GSS, 2019). The Tamale Teaching Hospital in the Northern regional capital, Tamale, serves as a referral tertiary hospital and a testing centre for SARS-CoV-2 for the five regions of Northern Ghana.

Study design and sample size

The study was designed to solicit the views of rural, peri-urban and urban communities. The questionnaires were administered randomly in the communities visited after a brief introduction about the purpose of the research. All the COVID-19 protocols were observed to minimize the risk of interviewer and the participants contracting the virus.

We interviewed 553 respondents from 18 communities from the five districts selected for the research. The districts were selected based on their proximity to Tamale, the Northern regional capital.

Study tool and data collection

Semi-structured questionnaires were administered face-to-face to gather information from respondents on their knowledge, perceptions, and attitudes towards the COVID-19 pandemic. The items captured in the questionnaire stemmed from an outreach program by way of a

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preliminary survey through observing activities of the people in a community. Therefore, it is important to note that items included in the questionnaire are a reflection of practices of the inhabitants and not an actual or standard practice. The semi-structured questionnaire was prepared in English and translated into the local language (Dagbani and Twi) of the respondents with translators where necessary. The interviews and questionnaires administration lasted from 23rd April to 8th of June 2020.

Limitations of the study

Larger sample size could not be attained due to financial constraints. However, the random sampling approach adopted gave the study the scientific rigor to be used as a baseline study for intervention measures to be taken to prevent and contain the spread of COVID-19.

Statistical Analysis

The data obtained were coded, processed, and analyzed using IBM SPSS Statistic version 20. Descriptive statistical method was used to summarize the data and the results presented using graphs and tables. Means were calculated and significant differences at $P<0.05$ were determined using the Pearson's chi square test.

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Results

Background Information of the Respondents

A total of five hundred and fifty-three respondents' views were solicited for the present study (Table 1). Of this number, 353 (63.8%) were inhabitants of rural communities and the rest (200) were individuals from peri-urban and urban centres within the Northern Region of Ghana. Demographically, male-female ratio of respondents was 56.8% (314) vs. 43.2% (239) of various age categories, ranging from age 14 to100. Nearly half of the respondents, 41.0% (227/533), have no formal education, and 54.5% (301/533) of them were not married. Almost all of the people interviewed (91.3%) hold religious beliefs, mostly Islam.

Table 1: Socio-demographic characteristics of the respondents (n = 553)

Variables	Categories	№	%
Sex	Male	314	56.8
	Female	239	43.2
Age	<18	113	20.4
	18- 25	201	36.3
	26- 35	144	26.0
	36- 45	48	8.7
	46- 55	26	4.7
	56+	21	3.9
Religion	Islam	505	91.3
	Christianity	46	8.3
	African Traditional Religion (ATR)	2	0.4
Marital Status	Single	294	53.2
	Married	252	45.6
	Widow/Widower	7	1.3
Educational Status	Non-formal education	227	41.0
	Primary	58	10.5

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	Junior High School (JHS)	106	19.2
	Senior High School (SHS)	105	19
	Tertiary	57	10.3
Locality	Rural communities	353	63.8
	Peri-urban/Urban	200	36.2

Source; Field survey (2020)

Time of first information about COVID-19

Concerning time of information about COVID-19, most 266 (48.1%) of the respondents revealed that they became aware of the virus in March (Fig 1). Only few 92 (16.6%) had knowledge of the existence of the virus when it started spreading in China in December, 2019. Per the respective settings, 140 (39.7%) and 126 (63%) of the rural inhabitants and peri-urban/urban, had knowledge of the virus in March.

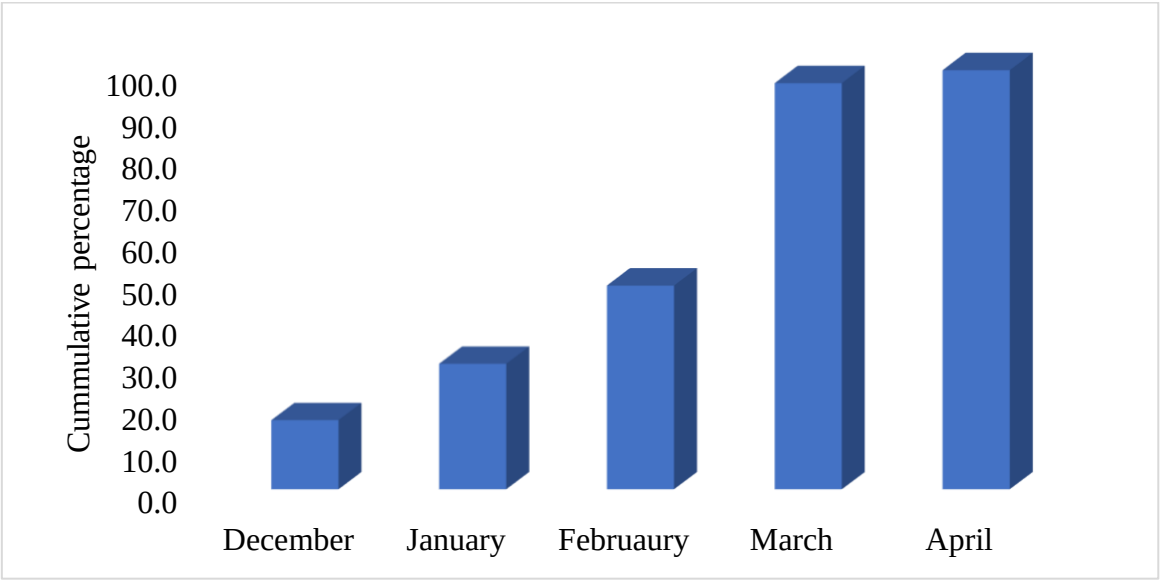

Figure 1: Time of first information about COVID-19

Source: Field survey (2020)

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Source of Information about COVID-19

Nearly all respondents, 90.42% (500/553) relied on the mass media (Radio, Television and Internet) for information on the novel coronavirus pandemic (Fig 2). The radio was much depended upon in the rural areas 63.0%) (222/353), whereas television was more relied upon in the urban and peri-urban areas, 51% (102/200). However, COVID-19 information is obtained from combinations of all mass media platform across the geographic settings. Nonetheless, there was a significant difference ($P < 0.05$) in the sources of information about COVID-19 available at the different geographical locations.

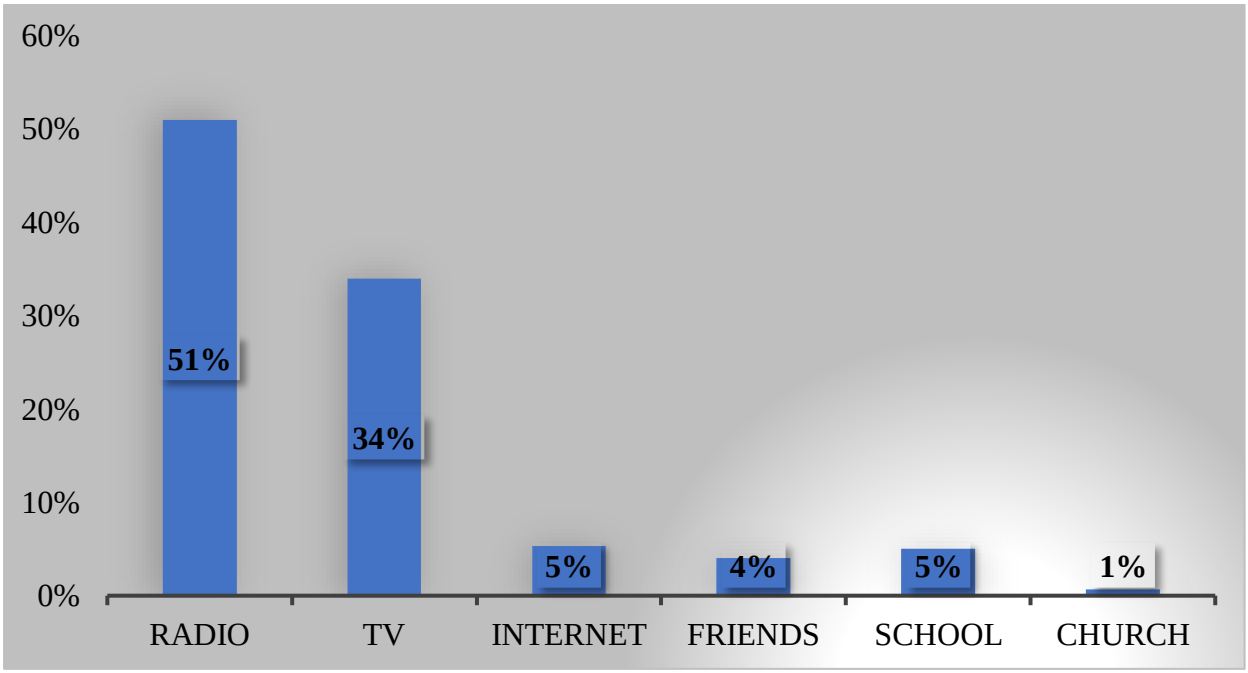

Figure 2: Source of Information about COVID-19

Source: Field survey (2020)

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Awareness and Knowledge about COVID-19

Different kind of questions were asked to assess respondents´ awareness and knowledge of COVID-19 (Table 2). All 553 (100%) respondents indicated they were aware and have heard of the novel coronavirus. Ninety-nine of the respondents, representing 18.0% think COVID-19 is not in Ghana. Per the respective geographic settings, 37 (18.5%) and 62 (17.6%) of the respondents in peri-urban/urban and rural areas, respectively, refused to accept that the virus is in Ghana.

Majority 385 (69.6%) of the respondents indicated that they cannot contract the virus either because they are living in a rural or urban setting. Of the 200 respondents from the peri-urban and/or urban settings, 60 (30%) revealed they cannot contract COVID-19. In the rural settings, 108 (31%) of the respondents also shared in the same thoughts as their urban counterparts. However, there was no significant difference (P = 0.884) between why respondents think they cannot contract the virus based on their settings.

Only 6 (1.1%) of the respondents indicated that there could be someone within their community with either SARS-CoV-2 or the disease, COVID-19. In the rural settings, 4 (1.1%) mentioned they suspect a case of COVID-19 in their community, whereas only 2 (1.0%) of the respondents in the peri-urban or urban settings suspect a case of COVID-19 in their community.

Nearly all 91.7% (503/553) of the respondents could mention at least two symptoms associated with COVID-19. In spite of that, 31 (8.5%) and 15 (7.5%) of the respondents in the rural and urban settings, respectively, indicated that they have no knowledge of the symptoms associated with COVID-19. There was no significant difference (P = 0.600) between respondents' geographical settings and their level of knowledge about symptoms of COVID-19.

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Table 2: Awareness and Knowledge about COVID-19

Variables	Categories	Frequency	%
Have you heard of coronavirus/COVID-19	Yes	553	100
	No	-	-
Do you think coronavirus/COVID-19 is in Ghana	Yes	454	82.1
	No	99	17.9
Do you think rural/urban people can contract COVID-19?	Yes	385	69.6
	No	168	30.4
Do you think there is someone in your community with COVID-19?	Yes	6	1.1
	No	547	99.9
Do you know the symptoms of COVID-19?	Yes	507	91.7
	No	46	8.3

Source; Field survey (2020)

Perceptions of Respondents about COVID-19

COVID-19 is a punishment from God

About their perceptions of COVID-19, the majority of respondents (85.0%) hold the view that the disease is a punishment from God (Table 3). This perception significantly transcends rural-urban: 215/353 (60.9%) and 156/200 (78.0%) respondents from rural and urban/peri-urban settings, respectively.

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Table 3: COVID-19 is a punishment from God

Description of Location	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Pearson's chi2 (p-value)
Rural	215	85	16	13	24	353	X_2 = 27.626
Peri-Urban/Urban	156	14	10	10	10	200	
Total	371	99	26	23	34	553	P-value = 0.000

Source; Field survey (2020)

COVID-19 is a disease from Satan/witches

When the question of whether COVID-19 is a disease from Satan was posed, majority (81.24%) frankly opined that the disease is an affliction from God, and reject to associate it with works of Satan (Table 4). This perception was more common among urban and peri-urban respondents (87.50%) than those in the rural areas (73.09%). Only 73 individuals held the perception that COVID-19 could also be a disease from Satan (witches).

Table 4: COVID-19 is a disease from Satan/witches

Description of Location	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Pearson's chi -square (p-value)
Rural	32	25	38	85	173	353	30.890
Peri-Urban/Urban	10	6	9	29	146	200	0.000
Total	42	31	47	114	319	553	

Source: Field survey (2020)

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COVID-19 is a disease for the rich people

The majority (81.99%) of our respondents actually indicated that the COVID-19 is not a disease that affect only the rich (Table 5). Both rural and urban and peri urban dwellers held similar views, but the belief was more common among respondents from the rural settings.

Table 5: COVID-19 is a disease for the rich people

Description of Location	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Pearson's chi2 (p-value)
Rural	40	18	40	89	166	353	72.379
Peri-Urban/Urban	11	2	5	15	167	200	(0.000)
Total	51	20	45	104	333	553	

Source: Field survey (2020)

COVID-19 cannot infect and/or kill rural/urban people

When respondents were asked whether they could be infected or killed by COVID-19, the majority concorded, thus 75.54% and 90.00% from rural and urban/peri-urban areas, respectively (Table 6). This notwithstanding, it is interesting to find some 140 (25.32%) individuals that thought otherwise and 19 others (3.44%) that neither agreed nor disagreed.

Table: COVID-19 cannot infect and kill rural/urban inhabitants

Description of Location	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Pearson's chi2 (p-value)
Rural	76	51	12	66	148	353	X_2 = 88.438
Peri-Urban/Urban	12	1	7	18	162	200	P-value =
Total	88	52	19	84	310	553	0.000

Source: Field survey (2020)

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Knowledge of the spread and/or transmission routes of COVID-19

Concerning how the virus spreads, 87.7% (485/553) of the respondents had some knowledge on the different ways by which the virus spreads (Table 7). Nevertheless, 20 (10%) and 48 (13.6%) of the respondents in peri-urban/urban and rural settings, respectively, indicated they had no knowledge of how the SARS-CoV-2 spreads. There was no significant difference (P = 0.216) related to the geographic settings of the respondents and their knowledge of the spread and/or transmission routes of SARS-CoV-2.

Interestingly, 385 (69.6%) of the respondents think that SARS-CoV-2 can be sexually transmitted. One hundred and forty representing 70% of the total population sampled from the peri-urban and/or urban settings indicated that sex can be one of the transmission routes of SARS-CoV-2. Concerning the rural settings, 245 (69.4%) were of the view that the novel coronavirus can be transmitted through sexual activities. There was no significant difference (P = 0.884) between the respondents in the rural settings and those in the peri-urban/urban on the spread of SARS-CoV-2 through sex.

Also, 357 (64.6%) of the respondents indicated that the consumption of contaminated foods can serve as a transmission route of SARS-CoV-2. Nevertheless, 51 (25.5%) and 145 (41.1%) of the respondents from the peri-urban/urban and rural settings respectively revealed that they have no idea the SARS-CoV-2 can spread through the consumption of contaminated foods. There was significant difference (P<0.05) between the geographical settings of the respondents and their level of knowledge of contaminated foods as transmission routes of SARS-CoV-2. Meanwhile, 238 (61.7%) of the 386 respondents who rely partially and/or fully on well, dugouts and dams as sources of water for domestic purposes revealed that such sources of water can lead to the spread of SARS-CoV-2, especially when water is left untreated before usage.

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Summary of the responses indicated level of knowledge of the spread of the novel coronavirus has been shown in Figure 3. According to 113 (37.0%) of the 305 respondents in the rural communities who have knowledge on the spread of the COVID-19, contact with an infected person remain the most important transmission route of contracting the SARS-CoV-2. Conversely, 68 (37.8%) of the 180 respondents from the peri-urban/urban settings categorically emphasized on hand-shaking as the highest transmission route of the virus.

Table 7: Knowledge of the spread and/or transmission routes of SARS-CoV-2

Variables	Categories	Frequency	%
Do you know how the novel coronavirus spreads?	Yes	485	87.7
	No	68	12.3
Do you think COVID-19 is sexually transmitted?	Yes	385	69.6
	No	168	30.4
Can COVID-19 be gotten through a contaminated food?	Yes	357	64.6
	No	196	35.4

Source; Field survey (2020)

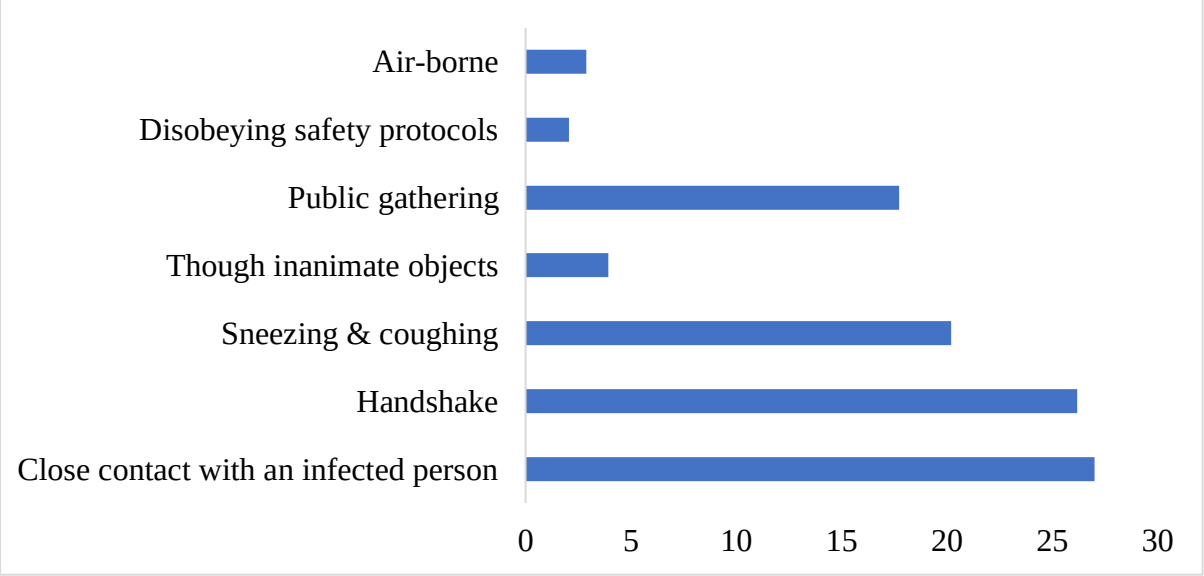

Figure 3: Means of spread of SARS-CoV-2

Source: Field survey (2020)

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Preparedness and observance of precautionary measures

Information on respondents' preparedness and adherence to precautionary measures against the COVID-19 was also sourced. Three hundred and eighty-eight (388) of the respondents representing 70.2% revealed that there has not been any sensitization program on the COVID-19 in their respective communities. Of the 353 respondents from the rural settings, 294 (83.3%) confessed that there has not been any direct educational programme by government institutions, NGOs or private bodies in their communities. Conversely, 106 (53%) of the 200 respondents interviewed in peri-urban and/or urban settings admitted going through a community sensitization program on COVID-19.

Majority 65.8% (364/553) of the respondents interviewed in the study confessed that they have been practicing social/physical distancing as recommended by health experts. In spite of this, 155 (43.9%) of the rural population revealed their inability to practice the social/physical distancing protocol as outlined by health experts. Meanwhile, only 34 (17%) of the respondents in the peri-urban and/or urban settings indicated their inability to adhere or practice the social/physical distancing protocol.

Also, nearly all 547 (98.9%) of the respondents practice hand washing. However, 18 (5.1%) and 9 (4.5%) of the rural and urban population respectively do not use soap when washing their hands. Again, it was revealed that 101 (28.6%) and 54 (27.0%) of the rural and urban population, respectively, undergo the handwashing practice, which could be described ineffective or unsatisfactory as compared to the protocol outlined by the Ghana Health Service. There was no significant difference (P=0.685) in the manner of which respondents in the rural and urban settings undergo handwashing.

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Health experts have advised the use of alcohol-based hand sanitizers to complement handwashing particularly at a time when handwashing is not possible. Of the 553 respondents, 411 (74.3%) neither possess nor practice the use of alcohol-based hand sanitizers. Only 80 (22.7%) and 62 (31%) of the respondents in the rural and urban settings, respectively, either possess or practice the use of alcohol-hand based sanitizer when necessary. There was significant difference ($P < 0.05$) between respondents in the rural and urban/peri-urban area in the use of alcohol-based hand sanitizer.

Also, majority 59.1% (327/553) of the respondents indicated they do not possess or practice the use of face masks, particularly when going to public places. Of the 353 respondents from the rural settings, 238 (67.4%) do not possess or practice the use of masks. In contrast, 111 (55.5%) of the respondents from the peri-urban and/or urban settings possess or practice the use of masks, particularly at public places. Again, there was significant difference ($P < 0.05$) as between the rural and urban/peri-urban respondents.

Table 2: Preparedness and observance of precautionary measures

Variables	Categories	Frequency	%
Has there been any community sensitization on	Yes	165	29.8
COVID-19?	No	388	70.2
Do you observe social distancing?	Yes	364	65.8
	No	189	34.2
Do you have nose mask?	Yes	225	40.7
	No	327	59.3
Do you own hand sanitizer?	Yes	142	26.7
	No	411	74.3
Do you wash your hands?	Yes	547	98.9
	No	6	1.1
Do you use soap and under running water?	Yes	526	95.1

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	No	27	4.9
How do you wash your hands?	Satisfactory	398	72.0
	Not satisfactory	155	28.0

Source; Field survey (2020)

Ranking of respondents' precautionary measures against COVID-19

Even though most of the respondents have indicated their awareness of the existence of the virus, 39 (7.1%) however revealed that they are not involved in any measure that sought to protect or prevent them from contracting the virus. Nonetheless, 514 (93.7%) indicated they are observing the social distancing protocols, spelt out by health experts or professionals. Upon ranking, it emerged that 336 (65.4%) of the respondents carried out regular handwashing as the top most precautionary measure against COVID-19. Few 65 (12.6%) and 28 (5.4%) of the respondents mentioned the observance of social/physical distance and avoiding public gatherings, respectively, as their precautionary measure against contracting the SARS-CoV-2. There was a significant different ($P<0.05$) between the geographical setting (rural and peri-urban/urban) of respondents and the choice of precautionary measure against COVID-19.

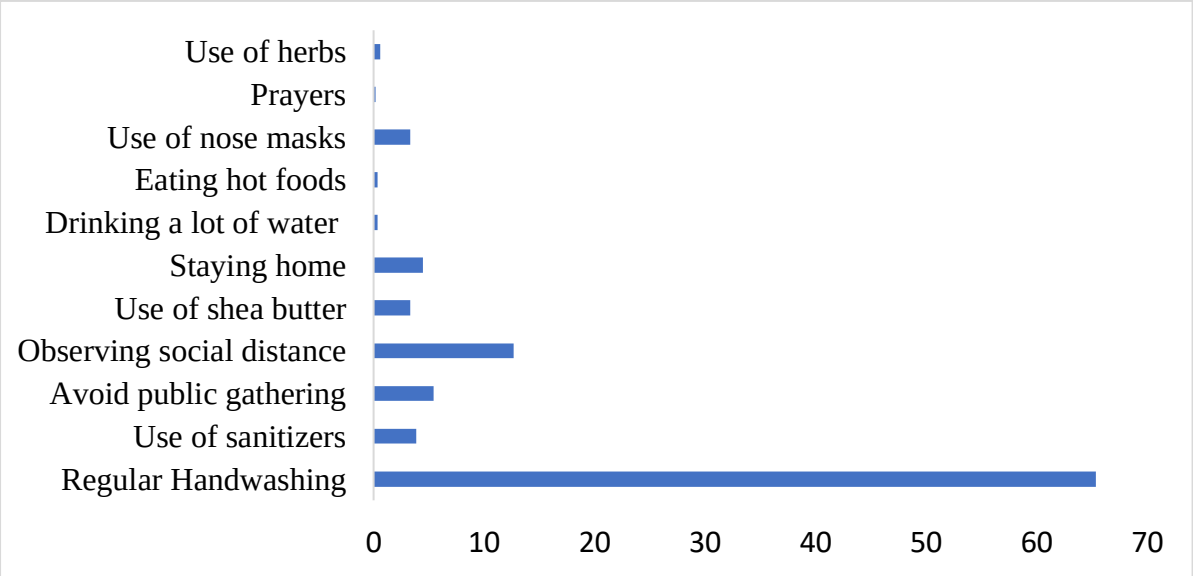

Figure 4: Ranking of respondents' precautionary measures against COVID-19

Source; Field survey (2020)

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Source of Water for Handwashing

Respondents were also interviewed on the source of water for handwashing. Most 316 (57.1%) of the respondents relied on potable water. Almost all 194 (97.0%) of the respondents in the peri-urban and/or urban settings use potable water for handwashing. However, nearly half 164 (46.5%) of the respondents in the rural settings depended on water from dams for handwashing, whereas 11 (3.1%) depend on the dugouts. There was a significant difference ($P<0.05$) between the geographical settings of respondents and the source of water for handwashing, as expected.

Table 3: Source of water for handwashing

Source of Water/ Description of setting	Dam	Dugout	Well	Pipe	Borehole
Rural	164(46.5%)	11(3.1%)	6(1.7%)	122(34.6%)	50(14.2)
Urban	-	-	4(2.0%)	194(97.0%)	2(1.0%)

Source; Field survey (2020)

Respondents who depend solely or partially on water from dams, dugouts, and wells were further interviewed on whether such water are treated by boiling before being used for handwashing. Of the 185 respondents who depend solely and/or partially on these sources of water for handwashing, 176 (95%) indicated that they do not boil the water before using it for handwashing.

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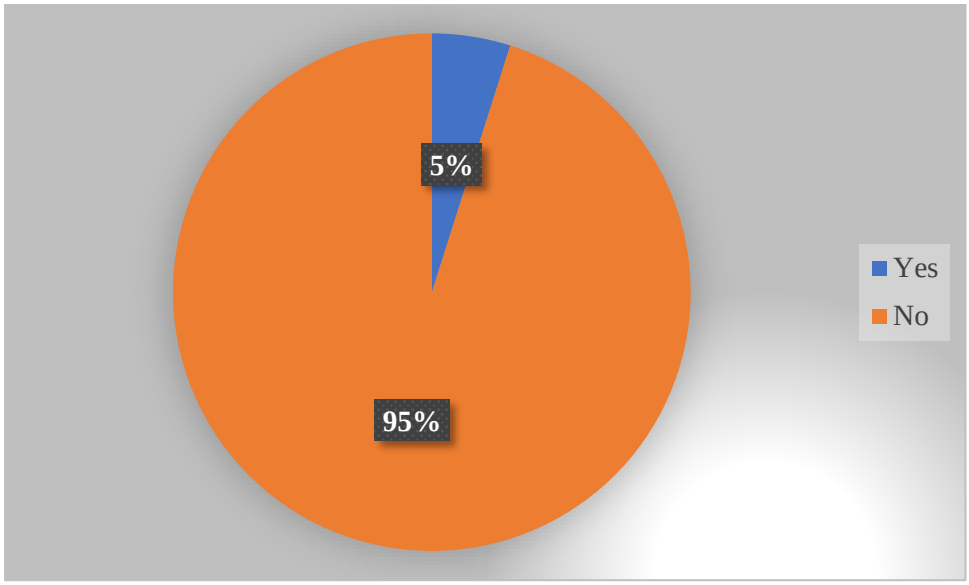

Figure 5: Treating water before using for hand washing

Source; Field survey (2020)

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Discussion

Globally, understanding of SARS-CoV-2 biology and the associated disease, has been progressing steadily since its outbreak in the last quarter of 2019 to early 2020. Many aspects of the virus biology, its mode of transmission and pathogenesis are still not understood. As a pandemic of global proportion, its spreading, knowledge, perception and awareness by all people are needed for national and international efforts in its control. There has been resistance in many countries including the USA about the adherence to some of the protocols. The current study was carried out to unravel the knowledge level, perceptions and attitudes of rural and peri-urban/urban communities in Northern Ghana on COVID-19. It is to be noted that most of the respondents in this study were young (below 46 years) which also reflects the typical demography of Ghana (GSS, 2012; Kpessa-Whyte, 2018). Apart from being the majority of Ghana's population, the youth are also considered to be the most sophisticated and up-to-date with current trends (UNFPA, 2020; United Nations, 2018) as would be expected also for COVID-19. Views held by this group are therefore, very crucial.

Awareness on COVID-19 in our study area was 100%. Despite the disparity in numbers of those who had formal education from those without, the use of multiple media platforms and local languages beside English in awareness creation and education of Ghana's populace on the disease ensured that, all categories of population were informed, as observed in this study. In the multitude of avenues of information on COVID-19, the radio and TV were the most common information platforms; this is especially true for radio among rural folks and the TV in the peri-urban and urban areas. This was attributed to the availability of several local and national radio and TV stations or channels, wide coverage of radio and TV and the availability of radio on different appliances, such as mobile phones etc. These modes of transmission made them very effective in communicating information on COVID-19 in the region and achieving maximum impact. Media houses are therefore very significant partners in the fight against

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COVID-19. It is recommended that in these difficult times, the radio/TV stations should as part of their cooperate-social responsibility make airtime available for provision of relevant information on COVID-19 such as the safety protocols, signs and symptoms, contact information of responsible health institutions for COVID-19 management as well as any new development about the virus. Effort should also be made in such on-air or on-TV education to provide information in relevant Ghanaian language of the target ethnic groups. A similar study that sought to understand the knowledge and awareness of young adults (mean age was 20.9 ±2.30 years) in Karachi, Pakistan found that most pursued platform for information for coronavirus was social media, followed by television and print media (Mubeen et al., 2020). Majority (58%) of their respondents had graduate degrees, unlike our respondents which had only few (10.3%) with tertiary level education and majority (41%) belonging to the non-formal education group.

It is important to indicate that most respondents got to know of COVID-19 in March, 2020. This is not surprising, because Ghana's first two cases of COVID-19 were first announced on 12th March 2020 making media headlines, scare and aroused national discourse. Despite the fact that COVID-19 broke out in Wuhan in December, 2019, information of its spread did not transcend to Ghana's population until it was declared as pandemic on the 11th of March and local cases were recorded. Indeed, the firm initial response of the Government of Ghana to close schools, prohibit social gatherings including religious worship, enforcing social distancing and lockdown of some cities as well as happenings in other countries around the globe brought a massive awareness of COVID-19 in all parts of Ghana.

Despite the absolute awareness of COVID-19 among all communities in this survey, the perception or believes about COVID-19 could be quite unscientific. The perception that COVID-19 is a punishment from God as seen with most of the respondents is very intriguing. In emphasis, they held the strong conviction that the pandemic was not caused by witches or

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wizards. It is possible that the bias of all respondents being religious persons might have influenced this popular perception. A couple of respondents explained their conviction that God sent the pandemic unto Earth to punish mankind for wrongdoings (sins). Popularization of this perception is certainly a problem in local, national and international efforts towards management of COVID-19. We call on stakeholders for targeted education of the populace to address this perception.

Regardless of the 'origin' of COVID-19, whether divine or natural, it was well understood among the majority of the people that, the virus can affect anyone of any race or economic strata. In addition, the mode of transmission, by contact, droplets from cough and sneeze that could be picked up in public gatherings and from contaminated surfaces were also well understood. It was, however, difficult to reconcile the familiarity of the people with the means of transmission of COVID-19 with their impression that transmission route is mainly through sexual contact. It is possible that the survey tool used to solicit respondents view presented too few probable transmission route options for selection. However, there are reports about the presence of the SARS-CoV-2 in semen of patients (Li et al., 2020) although a lot more investigations proved otherwise (Guo et al., 2020; Paoli et al., 2020). The wide penetration of the mass media in the study area means that every mention or discussion of SAR-CoV-2 in human semen on the air waves would inform many people of its possible sexual transmission route. Thus, any misinformation on air can be very damaging to the efforts in the management of the pandemic.

The expectation of governments and WHO is for people to protect themselves by observing all the precautionary protocols to reduce or avoid the risk of COVID-19 infection. When respondents were asked of their actions or preparedness to reduce or avoid COVID-19 risk, a good number of them responded affirmatively and even demonstrated satisfactorily hand washing exercise when an on-field test was done. However, it is the researchers' observation

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that, the majority of people in the studied communities did not observe the risk avoidance act of social distancing nor the risk reduction act of putting on face masks or frequent use of hand sanitizers. Though the majority claim to wash their hands under running water, it was not substantiated. It must be acknowledged that, even before COVID-19, people washed their hands and did so for different purposes but the present hand washing and enhanced hygiene movement is more geared toward reduction of risk of contracting COVID-19. As seen in our study, the majority of the people washed their hands using untreated water, which may mar the essence of the act. These untreated water sources could also be a source of other pathogenic organisms which may contaminate their hands (Pandey et al., 2014). There must be proactive and practical sensitization of the people on the COVID-19 pandemic since the prevention of diseases is known to hinge on how people perceive them (Spittel et al., 2019). Respondents from the rural population attributed their inability to observe the social or physical distancing protocol as outlined by health experts to some traditional activities like eating together. Again, most rural communities have a common place of resting/relaxing during the day time which is usually under the shade of a tree. *"As you can see, we have all gathered here to dehusk our harvested groundnut for sale. This work will be difficult for one person to do and thus require us coming together."* -this was a response of a respondent who gave reasons why social/physical distancing would be difficult to be observed in the rural communities. Nevertheless, some respondents indicated that they are family and knew themselves and as such don't understand the reason why they should fear each other. *"...I don't understand why we should practice social or physical distancing when we are outside because we eat together and sleep in the same room*"- a respondent justifying why they were grouped together.

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Conclusion

Most of the respondents were very much aware about the COVID-19 pandemic in Ghana and around the globe. Belief held by the majority of the respondents is that it is a punishment from God. Hygiene practices, especially in the rural settings, are highly compromised, since most of the respondents use water from untreated sources for hand washing. Extensive and evidence-based education is required to harness the already existing awareness level about the disease in most communities especially in the light of the new findings from investigations being carried out by scientists around the world. Our findings may help local government to fight the COVID-19 since the social distancing and other preventive measures are not fully embraced and these important in the light of the increasing number of cases and deaths in the country.

Recommendations

Similar studies should be conducted in other parts of Ghana as well as sub-Saharan Africa to understand the knowledge level, perception and attitudes of the people regarding the COVID-19. Since the virus is commonly perceived to be God's punishment, religious leaders will play a very important role in the dissemination of relevant information on the disease. Community sensitization and evidence-based information will be the key to reduce further spread of the disease in the communities. Communities without access to treated water for hand washing should be advised to boil the water or use other treatment methods available to purify water before use.

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References

Ajayi, A. I., Mudefi, E., Yusuf, M. S., Adeniyi, O. V., Rala, N., and Goon, D. T. (2019). "Low Awareness and Use of Pre-Exposure Prophylaxis among Adolescents and Young Adults in High HIV and Sexual Violence Prevalence Settings." *Medicine (Baltimore)* 98(43):e17716.

Ananga, M. K., Nuworza, K., Akporlu, J. M., and Asante, O. K. (2017). "Knowledge, Acceptance and Utilisation of the Female Condom among Women of Reproductive Age in Ghana." *Contraception and Reproductive Medicine* 2(1):15. doi:10.1186/s40834-017-0042-9

Díaz de León-Martínez, L., De la Sierra-de la Vega, L., Palacios-Ramírez, A ., Rodriguez-Aguilar, A., and Flores-Ramírez, R. (2020). "Critical Review of Social, Environmental and Health Risk Factors in the Mexican Indigenous Population and Their Capacity to Respond to the COVID-19." *Science of The Total Environment* 733:139357. doi:10.1016/j.scitotenv.2020.139357

Ghana Statistical Services (GSS). (2019). *Population by Regions (Northern)*. Accra, Ghana. Accessed on 20th July, 2020 on https://www.statsghana.gov.gh/regionalpopulation.php?population=MTQyNTEzNjcwMC4zMzE=&&Northern&regid=6

Ghana Statistical Service (GSS). (2012). "2010 Population and Housing Census, Summary of Report of Final Results." *Ghana Statistical Service* 1–117. doi: 10.1371/journal.pone.0104053

Guo, L., Zhao, S., Li, W., Wang, Y., Li, L., Jiang, S., Ren, W., Yuan, Q., Zhang, F., Kong, F., Lei, J., and Yuan, M. (2020). "Absence of SARS-CoV-2 in Semen of a COVID-19 Patient Cohort." *Andrology* andr.12848. doi:10.1111/andr.12848

Hernández-García, I., and Giménez-Júlvez, T. (2020). "Assessment of Health Information

About COVID-19 Prevention on the Internet: Infodemiological Study." *JMIR Public Health and Surveillance* 6(2):e18717. doi:10.2196/18717

Kpessa-Whyte, M. (2018). "Aging and Demographic Transition in Ghana: State of the Elderly and Emerging Issues." *Gerontologist* 58(3):403–8.

Merga, N., and Alemayehu, T. (2015). "Knowledge, Perception, and Management Skills of Mothers with under-Five Children about Diarrhoeal Disease in Indigenous and Resettlement Communities in Assosa District, Western Ethiopia." *J Health Popul Nutr* 33(1):20–30.

Mtuy, T. B., Burton, M. J., Mwingira, U., Ngondi, J. M., Seeley, J and Lees, S. (2019). "Knowledge, Perceptions and Experiences of Trachoma among Maasai in Tanzania: Implications for Prevention and Control" edited by M. C. Freeman. *PLOS Neglected Tropical Diseases* 13(6):e0007508. doi:10.1371/journal.pntd.0007508

Mubeen, S., Kamal, S., Kamal, S., and Balkhi, F. (2020). "Knowledge and Awareness Regarding Spread and Prevention of COVID-19 among the Young Adults of Karachi." *Journal of the Pakistan Medical Association* 1. doi:10.5455/JPMA.40

Pandey, P. K., Kass, P. H., Soupir, M. L., Biswas, S and Singh, V. P. (2014). "Contamination of Water Resources by Pathogenic Bacteria." *AMB Express* 4(1):51.

Paoli, D., Pallotti, F., Colangelo, S., Basilico, F., Mazzuti, L., Turriziani, O., Antonelli, G., Lenzi, A and Lombardo, F. (2020). "Study of SARS-CoV-2 in Semen and Urine Samples of a Volunteer with Positive Naso-Pharyngeal Swab." *Journal of Endocrinological Investigation*. doi:10.1007/s40618-020-01261-1

Spittel, S., Maier, A., and Kraus, E. (2019). "Awareness Challenges of Mental Health Disorder and Dementia Facing Stigmatisation and Discrimination: A Systematic Literature Review from Sub-Sahara Africa." *Journal of Global Health* 9(2). doi:10.7189/jogh.09.020419

UNFPA. 2020. “Adolescents and Young People & Coronavirus Disease (COVID-19) UPDATED.” 1–3.

United Nations. 2018. *World Youth Report: Youth and the 2030 Agenda for Sustainable Development World*.

Workneh, T., Emirie, G., Kaba, M., Mekonnen, Y., and Kloos, H. (2018). “Perceptions of Health and Illness among the Konso People of Southwestern Ethiopia: Persistence and Change.” *Journal of Ethnobiology and Ethnomedicine* 14(1):18. doi:10.1186/s13002-018-0214-y