

COVID-19 Perception, Attitude, and Communication (COVPAC) Survey; the Value of Perceived Risk to Adherence

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Research

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Abstract

Aim: An understanding of the following; the level of knowledge, perception, attitudes, and the nature of risk communication to a population is important to national efforts at disease control in a situation of epidemic and pandemic. To this end, it was aimed to provide insight on the knowledge, perception, and attitude towards coronavirus disease-19 prevention, particularly, towards communication and adherence to protocols. The survey was carried out during the second wave of severe acute respiratory syndrome coronavirus-2 infections and the reopening of schools in the country.

Subjects and methods: A cross-sectional online survey with a self-administered Knowledge-Attitude-Practise questionnaire was conducted between January and February 2021. Overall, two hundred and eight (208) cohorts were reached via WhatsApp by a combination of convenience and snowball sampling.

Results: Although, the demographic information was generally unbiased, the educational level showed that the findings were mainly skewed towards the high-end of the educated in Ghana. It was evident that there were non-coronavirus disease-19 related prevention actions that complemented the COVID-19 prevention protocol. Additionally, self-driven factors were the least source of motivation to adhering to prevention protocols, while other people's behaviour and new COVID-19 related information and related risk of harm to pupils were the most motivating factors on the perceptions on adherence to the prevention protocols.

Conclusion: The study provides useful insights on a section of the population that is the high-end of the expectations on adherence. This, therefore, forms a useful basis for what should be expected among the general population and for newer prevention actions such as the ongoing vaccination campaigns.

Introduction

One of the emerging respiratory viruses known to cause illness ranging from the common cold to severe acute respiratory syndrome (SARS) is the coronavirus (CoV) [1]. The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a strain of coronavirus that causes coronavirus disease. The initial outbreak of coronavirus disease was detected in Wuhan, China, in late 2019, and in January 2020, the WHO recommended "2019 novel coronavirus" as the provisional nomenclature for the virus, and practically referred to the disease as COVID-19 [2]. The Eurosurveillance Editorial Team further declared COVID-19 as a public health emergency of international concern [3]. Over time, almost all countries on the entire globe had reported some COVID-19 cases; however, the virus expanded extremely in Asia, the Americas, and Europe, then subsequently in Africa [4, 5]. As of 2nd March 2021, over 115,096,040 cases had been recorded in the world, with 2,552,344 deaths and 90,802,759 recoveries. Jin et al. (2020) reported that men are at higher risk of dying than women [6].

COVID-19 is spread by human-to-human contact through droplets, feco-oral, and direct contact, with an incubation period of 2–14 days [7]. The symptoms of COVID-19 illness range from very mild (fever and

respiratory symptoms such as cough and shortness of breath) to severe (pneumonia, severe acute respiratory syndrome, and kidney failure) with a mortality rate of around 4% [8]. Elderly persons and those suffering from co-morbidities like heart disease, lung disease and diabetes are at higher risk of developing severe COVID-19 illness [4]. However, in Ghana over 100, 000 cases have been recorded so far with over 950 deaths and 77,972 recoveries according to the Ghana Health Service (GHS). The data from the GHS further indicates that 58% of men were infected against 42% women.

The acute impact of the unprecedented COVID-19 pandemic on the health, economy and the general movement of humans has been felt across every facet of the world. Both developed and developing countries, individuals and communities are battling to respond to the impact of the pandemic with very different dynamics. It is worth noting that pieces of evidence in response to understanding the very nature of the COVID-19 are fast evolving, and the findings are subject to change. Thus, it would be imperative under the circumstances to exercise care in drawing definite conclusions on the prevailing findings.

Close observation among sections of the Ghanaian public suggests that individuals may be holding and spreading false senses of not going to be infected by SARS-CoV-2, thereby potentially creating confusion among others as to what to do regarding adhering to the main prevention protocols. These most likely are influenced by limited knowledge on the acquisition and transmission of SARS-CoV-2 infection and its prevention. If felt without an understanding of it, this situation will greatly limit the national effort at fighting the spread of the infection and limit the number of persons who may be going for COVID-19 vaccination.

The survey will provide fundamental information for further insight into the coronavirus pandemic in Ghana. Responses from a selected group of individuals on their knowledge, perception and awareness of COVID-19 will help understand the issues driving public response to the national efforts and help strategize for the larger population. It will offer the opportunity for planned evidence targeted at health policy formulations and interventions that can contribute to decreasing the coronavirus pandemic and encouraging vaccination. There is an African adage that says “what happens may not matter as much as how one chooses to respond to it”. Undoubtedly, actions are influenced by information and the perception of it. People do respond by behaving less cautiously when risk-reducing innovations are becoming effective (i.e., risk compensation) [9, 10, 11], therefore, to avoid non-adherence, communication of prevention must be tailored to targeting what people may likely respond to over time aside the regular prevention approaches. Therefore, the present survey has been designed to assess the level of awareness and the growing perceptions of the COVID-19 prevention protocols and communication following the gradual ease of restrictions, the second wave being in force, nationwide vaccination being rolled out and a third wave being anticipated.

The study was aimed at determining the level of knowledge on the cause, symptoms of COVID-19 and the preventive protocols, as well as estimating the proportion of different infection statuses among the respondents. Furthermore, the study sought to determine the perceptions on the preventive/adherence to protocols among respondents, and prevention by means other than the prevention protocols. The study

also determined the attitudes and related reasons of respondents regarding communication about COVID-19.

Method

Study design and sampling

A cross-sectional survey that used a self-administered questionnaire was carried out online via the social media handle; WhatsApp. The link to the questionnaire was made available via WhatsApp, first by convenience sampling of WhatsApp platforms of identifiable cohorts, and then secondly by snowballing; where respondents were requested to forward the link to other WhatsApp platforms that are linked to them. Respondents were then requested to partake in the online survey if they were resident in Ghana and were able to respond to the questions on a smartphone or a web browser on a personal computer. Collection of data was between January 2021 and February 2021, when it appeared that the second wave of infections (including that of some new variants) was increasing.

Data collection and Management

A self-administered and structured questionnaire was used to collect socio-demographic data such as sex, age, educational level and occupation among others. Data on respondents' level of knowledge on the cause, symptoms and prevention were derived. Additionally, data on infection status and perception on COVID-19 protocol and non-COVID-19 protocol-related prevention actions and attitude towards the virus were collected. Finally, data on perceptions on COVID-19 related communication were collected. See supplementary information file for the data set generated and analysed in this study. Descriptive statistics and proportions were used to summarize the distribution of the responses, and a weighted average index (WAI), on a scale of -2 to 2, was used to estimate relative levels and the group positions (composite extent) in respect to the variables for each of the objectives set out for the study.

Ethical Issues

This study presents minimal risk with no identifiable study-related harm to participants of the study. Participation in the survey was entirely voluntary and anonymous. A written (online indication) informed consent was obtained from each prospective participant in a manner that a prospective participant would not have access to the questions except after giving consent. Ethical approval (RAMS/ERCP/SS/04/2020) was obtained from the Ethical Review Committee of the Radiological and Medical Sciences Research Institute of the Ghana Atomic Energy Commission.

Results

Distribution of respondents' characteristics

Based on the use of a WhatsApp platform for the recruitment of participants, it was not determined how many persons were reached with the questionnaire. However, of the 208 respondents, the data of two (2)

indicated they did not consent to the study and so their data were not analysed. Meanwhile, the sex distribution turned out to be even and the age distribution showed that most (40.8%) of the respondents were within the age range of 30 – 39 years. The proportion of the other age groups that ranges lower and higher than that progressively reduced (Table 1). Furthermore, Table 1 shows that the respondents to this survey were predominantly (96.6%) persons with tertiary level education and a few (3.5%) with educational levels not lower than junior high school and its equivalent levels. It was also derived that the respondents worked in numerous sectors of the Ghanaian economy; with education (14.1%), finance (12.6%), and research (11.7%) being the most representative.

Table 1
Distribution of the demographic characteristics of respondents.

Demographic category	Frequency	Percentage (%)
Sex		
Female	102	49.51
Male	104	50.48
Age		
< 20 years	3	1.45
20 – 29 years	68	33.00
30 – 39 years	84	40.77
40 – 49 years	47	22.81
50 – 59 years	1	0.48
> 60 years	3	1.45
Education		
No formal education	0	0.00
Primary	0	0.00
JSS/JHS/O Level	1	0.48
SSS/SHS/A Level	3	1.45
Post-secondary	3	1.45
Tertiary	199	96.60
Sector of Occupation		
Education	29	14.07
Finance	26	12.62
Research	24	11.65
Student	21	10.19
Health	19	9.22
Administration	15	7.28
National Service	14	6.79
Service	14	6.79

Demographic category	Frequency	Percentage (%)
Businesses	11	5.33
Communication	10	4.85
Industry	5	2.42
Others	10	4.85
Unemployed	6	2.91
No response	2	0.97
Total	206	100

The distribution of the regions of residence and workplace of the 206 respondents showed that most of them worked and lived in the Greater Accra region (Table 2) where the capital city is located. A detailed analysis showed that these locations in the Greater Accra region were in more than two-thirds of its districts. Additionally, the number of respondents decreased as one moved towards the northern part of the country, with no respondents in and beyond the Bono East and Ahafo regions.

Table 2
Regional distribution of respondents' locations.

Region	Number (%) of respondents'	
	Residence	Workplace
Accra	163 (79.1)	160 (77.7)
Central	13 (6.3)	8 (3.9)
Ashanti	10 (4.9)	9 (4.4)
Eastern	8 (3.9)	6 (2.9)
Western	4 (1.9)	6 (2.9)
Other regions	7 (3.4)*	10 (4.8)^
No response	1 (0.5)	7 (3.4)
Total	206 (100.0)	206 (100.0)
*Ahafo; Bono; Bono East; Oti; Volta. ^Bono; Oti; Volta		

Knowledge on cause, symptoms and prevention

The outcome of the survey indicated that the majority (201/206; 97.6%) of the respondents knew that the causative agent of COVID-19 is a virus. The other five (5) participants either did not respond (1/206) or

indicated wrongly that the causative agent is a bacterium (n = 4; 1.9%). Regarding the symptoms of COVID-19, although, the WHO indicated symptoms were appropriately known, with a composite WAI of 1.4 (on a scale of -2.0 to 2.0), the most acknowledged symptom was difficulty in breathing (WAI = 1.7) and the least known was headache. Table 3 shows the relative levels of knowledge on all the studied symptoms.

Table 3
Extent of knowledge on the different symptoms of COVID-19.

Symptoms	weighted average index*	Inference
Difficulty breathing	1.7	Appropriate
Dry cough	1.5	Appropriate
Loss of taste and smell	1.5	Appropriate
Fever	1.4	Adequate/Good
Sore throat	1.3	Adequate/Good
Headache	1.3	Adequate/Good
Composite measure	1.4	Adequate/Good
*On a scale of 2 to -2 where > 0 is good knowledge, 0 is neutral/balanced; < 0 is inappropriate knowledge		

Table 4 shows the ranged levels of knowledge on the five main prevention protocols. The overall level of knowledge on the prevention protocols among the respondents was good and high (composite WAI of 1.5) but not as high as that of the level of knowledge on the wearing of facemask, which was the highest and good (WAI of 1.7). Interestingly, washing of hands with soap was the least acknowledged prevention protocol, with the lowest but a good level of knowledge (WAI of 1.1).

Table 4
Extent of knowledge on the different COVID-19 prevention protocols.

Prevention Protocol	weighted average index*	Inference
Wearing of face mask	1.7	Appropriate
Use of alcohol-based hand	1.6	Appropriate
Keeping a distance of	1.6	Appropriate
Alcohol content	1.3	Adequate
Washing of hands	1.1	Adequate
Composite measure	1.5	Appropriate
*On a scale of 2 to -2 where > 0 is good knowledge, 0 is neutral/balanced; < 0 is inappropriate knowledge		

Infection status

The prevalence of testing (recent/previous) among the 206 respondents was determined to be 25% (n = 52). As presented in Fig. 1, 40 (76.9%) of the respondents who took a COVID test were negative and 35% of them indicated they had symptoms. Again, of the 52 respondents who tested, 7 (13.5%) indicated they were positive at the time of the test but were negative at the time of the survey (i.e., recovered), and out of these 7, 71% indicated they had symptoms. Furthermore, of the 52 who tested, 5 (9.6%) were positive at the time of the study (active cases) but only 60% of them reported having symptoms.

Perception on infection and prevention

Each of the five perceptions on what may influence the likelihood of not getting infected with coronavirus, irrespective of adhering to the main prevention protocols were all determined to have been generally denied by the respondents (Table 5). Of the five perceptions assessed in this study, the most denied perception (WAI of -1.2) was that self-medication with orthodox medicine reduces the likelihood of getting infected, and the least denied (-0.7) was that prayer to God for protection reduces the likelihood of getting infected.

Table 5

Perception of not going to be infected with SARS-CoV-2 irrespective of the extent of adherence to COVID-19 protocols.

Perceptions irrespective of adherence to protocols	Weighted average index*	Inference
Self-medication with orthodox medicine	-1.2	Moderate Denial
Not destined to be infected with the coronavirus	-1.1	Moderate Denial
Eat healthy foods	-1.0	Denial
Taking herbal preparations to boost immunity	-0.9	Limited denial
Prayer to God to protect me from the coronavirus	-0.7	Limited denial
*On a scale of 2 to -2 where > 0 is hold the perception, 0 is neutral/balanced; < 0 is denying the perception		

Following the determination of the extent to which these perceptions were denied overall, the study further assessed the occurrences of actions related to them and the perceptions based on the COVID-19 prevention protocols. It was determined that the four actions perceived to prevent SARS-CoV-2 infection based on the COVID-19 prevention protocols were more prevalent; specified between 59.7% and 85.0% of respondents, than those not related to the COVID-19 protocols; also quantified between 29.1% and 55.8% of respondents. While the use of hand sanitisers was the most prevalent COVID-19 protocol-based action (85.0%), seeking God's protection was the most prevalent non-COVID-19 protocol-based action (55.8%). Interestingly, 7.3% of the respondents reported that they did not adhere to any of the eight perceived actions to prevent being infected with SARS-CoV-2. Table 6 presents the prevalence of all perceived actions for both categories.

Table 6
Prevalence of actions perceived to prevent SARS-CoV-2 infection

Perceived actions that prevent SARS-CoV-2 infection	Occurrences	(%)*
COVID-19 Protocol related		
I mostly use hand sanitisers	175	85.0
I mostly wear a face mask when I am outdoors	167	81.1
I mostly wash my hands with soap and running water	163	79.1
I mostly keep at least a 1-meter distances from the next person	123	59.7
Non-COVID-19 Protocol related		
God is protecting me from the infection	115	55.8
I am eating well	103	50.0
I am taking herbal preparation to boost my immune system	60	29.1
I am taking orthodox medications to boost my immune system	31	15.0
None of the above	15	7.3
None response	2	1.0
*Percentages are of the 206 respondents		

Since the adherence to all the perceived action was considered beneficial, the study further assessed the combination of the actions taken by the cohorts in their efforts to prevent infection with SARS-CoV-2. On that score, prevalence of a combination of six of the eight actions was the highest but among only 27.7% and the proportion that followed all eight were even fewer (3.4%) than those who took only one action (4.4%). Figure 2 depicts the distribution of the respondents among the various combinations of actions.

The study again sought to determine the contribution of each action to the combination of actions taken. The outcome of the determination (Table 7) shows that the respondents who washed their hands with soap under running water always took at least one additional action. Those who took actions related to praying to God, taking orthodox medications to boost their immune system or taking herbal preparations to boost their immune system, did so at least with two other perceived actions. On the other hand, those who took only one action either used hand sanitisers, wore a facemask, ate well, or kept at least a 1-meter distance from the next proximal person. Additionally, those who took six or more actions always used hand sanitisers, wore facemask and washed hands with soap and running water.

Table 7

Distribution of the occurrence of actions related to perceptions on the prevention of SARS-CoV-2 infection stratified by specific combinations

Perceived actions that prevent SARS-CoV-2 infection	Combined occurrences, (%)							
	One	Two	Three	Four	Five	Six	Seven	Eight
I mostly use hand sanitisers	11.1	100.0	96.0	93.5	90.6	100.0	100.0	100.0
I mostly wash my hands with soap and running water	0.0	60.0	48.0	93.5	100.0	100.0	100.0	100.0
I mostly wear a face mask when I am outdoors	11.1	20.0	76.0	93.5	93.8	100.0	100.0	100.0
I am eating well	11.1	0.0	12.0	16.1	53.1	82.5	100.0	100.0
I mostly keep at least a 1-meter distances from the next person	66.7	20.0	44.0	35.5	50.0	86.0	95.7	100.0
God is protecting from the infection	0.0	0.0	8.0	48.4	62.5	86.0	95.7	100.0
I am taking orthodox medications to boost my immune system	0.0	0.0	4.0	12.9	15.6	12.3	30.4	100.0
I am taking herbal preparation to boost my immune system	0.0	0.0	12.0	6.5	34.4	33.3	78.3	100.0
Total number	9	5	25	31	32	57	23	9

Attitude towards communication on COVID-19

An assessment of the attitude of respondents to communication on COVID-19 within four different categories was conducted in this study; these were those driven/influenced by self, external/actions of others, COVID-19 information, and adequacy of information (Table 8). The respondents' denial of self-driven factors polled highest for loss of interest in adhering to the prevention protocol, however, it was to a lesser extent (WAI of -1.1). Consequently, there was an overall indifferent attitude towards the Presidential update (WAI of 0.0). Again, the denial of the influence of the actions of others on respondents' loss of interest were all very weak (WAI of -0.3 and -0.4). On the other hand, the drivers of interest of respondents in the information on COVID-19 were the emergence of the reopening of schools and the onset of the new strain of the virus; these were strong (WAI of 1.0 and 0.8, respectively). In regards to the nature of the information provided, respondents had the perception that there was a need for further information, and there was inadequate detail regarding the measures for children going back to school (WAI of 1.1 and 0.5 respectively). The respondents' denial that the time between the recent communication and its implementation was inadequate was very weak (WAI of -0.1).

Table 8
Extent of different factors influencing attitudes towards COVID-19 communications

Attitude towards COVID-19 communication	Weighted Average Index*
Self-driven	
Fed-up with or have lost interest in adhering to the preventive protocols.	-1.1
Fed-up with following up on the COVID-19 related numbers despite the recent upsurge in cases.	-0.2
Lost interest in the presidential update.	0.0
Composite_ Self-driven	-0.5
Externally driven	
The attitude of persons in responsible positions towards COVID-19 contributes to me being fed-up with/losing interest in following the protocols on COVID-19 prevention.	-0.4
Irregular reporting of COVID-19 cases contributes to my being fed-up or losing interest in COVID-19 issues	-0.3
Composite extent_ Externally driven	-0.4
COVID-19 information-driven	
More interested in the information on COVID-19 following the re-opening of schools	1.0
More interested in the information on COVID-19 due to the emergence of the new strain	0.8
Composite extent_ information-driven	0.9
Nature of information	
There is a need for further information for the populace to know what to do regarding the preventive measures for children going to school	1.1
Limited detail on the COVID-19 measures related to school reopening, contributed to parent/guardian not being clear as to what to do.	0.5
The timing between the recent communication and its implementation is inadequate.	-0.1
*On a scale of 2 to -2 where > 0 is supportive attitude, 0 is balanced; < 0 is denying attitude	

Discussion

Intending to understand the perception and attitude, particularly, with regard to communication on COVID-19 prevention and control, and thereby contribute to improving the outcomes of efforts at preventing the

spread of COVID-19 and maximizing the benefits of vaccination, this descriptive survey employed an online-based sampling method. A look at the representation of the participants showed a bias for persons with tertiary education (Table 1). This implies that the views analysed in this report are of those with the ability and capacity to seek further information, and who are most likely able to better understand most of the information on COVID-19 as well as verify and identify misinformation and disinformation.

Additionally, it is reasonable therefore to expect that the levels of knowledge, perceptions, and attitudes particularly on communication on COVID-19 prevention and control of such persons will be the high-end among the populace in Ghana. In other words, although arguable, it is expected that the general populace will not have levels of knowledge higher than determined in this study nor have perceptions and attitudes that may be better than determined in this study.

With these limitations and assumptions in mind, the levels of knowledge on the cause (97.6%) and symptoms (Table 3) were expected to be as high as was determined given that education and sharing of information on the COVID-19 pandemic had been going on for a little over a year. This correlates with the findings of a study carried out in Nigeria among 589 participants, where a majority (99.5%) of them had good knowledge about COVID-19 [12]. Furthermore, it can be deduced from this study that the levels of knowledge on all the symptoms of the disease were at least adequate. Comparing this to an earlier study conducted in Ghana among a specific group of health professionals [13], difficulty in breathing was similarly the most and appropriately known symptom; (WAI of 1.7 on a scale of 2 to -2 for this study and WAI of 4.7 on a scale of 1 to 5 for the other study). However, the levels of knowledge on some of the symptoms were lower in the other studies. This may be because the respondents in this study are at the high-end of the level of knowledge and/or that there has been an improvement in knowledge gained over time between the two studies. Additionally, the fact that difficulty in breathing was the prevalent symptom may explain the commonly stated perception held by some section of Ghanaians that the disease does not exist because they do not see people present with dyspnea and needing ventilators similar to what they observe in countries in Europe and the USA and China. That is to say, if the most known symptoms (difficulty in breathing and dry cough) are rarely observed, then the virus may not be present, which is the faulty logic of that perception.

The findings as presented in Figure 1 show a low level of testing, 25.0% and correspondingly a lower level of active cases and recovery. However, it remained unclear how the prevalence of COVID-19 cases is relatively very low in most African countries including Ghana. However, what is of interest in our data is the extent to which those who have recovered, and those who had active cases at the time of the survey were uncertain about their symptoms. It may be intuitive that as much as 65.0% of those who were negative would be uncertain about their symptoms, however, the fact that those who had an active case and those who had recovered indicated that they were not certain about their symptoms at the time of the survey may imply one of the two possibilities. Firstly, because the prevalent symptoms (as indicated in Table 3) were not common among those they had, and also because the common symptoms in Ghana were less known and non-specific; the respondents were not associating these with COVID-19. Secondly,

this may be suggestive of the level of asymptomatic cases circulating in the country, which our finding suggests being between 29.0% and 40.0%.

The study's next interest was to determine the extent to which non-COVID-19 protocol related perceptions were held by the respondents, irrespective of the extent of adherence to the prevention protocols of COVID-19. Table 5 shows that each of the five (5) perceptions studied were generally denied. This implies that these were not likely to interfere with the adherence to the prevention protocols and, therefore, were not threats to the transmission of the virus. Additionally, it was not surprising that the least denied perception (in other words, this was the leading perception) was "prayer to God for protection against coronavirus". This is because Ghanaians are generally religious people and it is common for them to include religion in the health-seeking behaviour. The cases of patients going to prayer camps to seek cancer treatment are quite common in Ghana [14]. Again, the finding that self-medication with orthodox medicine was the most denied was not surprising since there was no clear orthodox medication confirmed for COVID-19 treatment. The speculation about hydroxyl chloroquine as a treatment for COVID-19 had been debunked at the time of this study and overtime during the pandemic. In the absence of a confirmed orthodox medicine, the perception of the use of herbal preparations to boost immunity was understandably the second least denied among the five.

The finding that (Table 6) adherence to the prevention protocols had the highest occurrence as the action perceptive to prevent the infection by SARS-CoV-2 is a positive indication to the prevention of COVID-19 during the second wave. It also confirms the earlier claim that the non-COVID-19 related prevention actions were mostly denied and, therefore, not held alone by the few who held them. The interesting twist was that, in combination with the prevention protocols, "eating well" (i.e., eating a well-balanced diet) was now more common than the use of herbal preparations to boost immunity by a greater margin (50.0% compared to 29.1%, respectively). Though few, the proportion of respondents that indicate both the prevention protocols and the non-COVID-19 prevention action could protect against the viral infection was unexpected among respondents of such a demographic distribution, and indicate the need for more explanation on how specifically the protocols work to prevent infection. This may also imply that a greater proportion among the general population may hold this view.

When the study further sought insight about adherences, the finding that a little less than 42.5% (Fig. 2) of the respondents adhered to six or more of both the COVID-19 and non-COVID-19 prevention protocols implied the need to rethink the means of encouraging adherence to the prevention protocols. As has been indicated by other claims, people behave less cautiously if they perceive those innovations are reducing risk and actual outcomes are reducing [9, 10]. Therefore, once the restrictions were being eased, it will be expected that people will be less adherent, but it was not expected to be very low. However, the good news was that the additional analysis showed that three of the four COVID-19 prevention protocols were always part of six or more prevention protocols adhered to; that which was absent was social distancing (Table 7). The analysis also showed that three of the four non-COVID-19 prevention actions were always taken in addition to two or more of the other prevention protocols (never done alone); a situation which is very encouraging since these non-COVID-19 protocols were being used in addition to the COVID-19

protocols. However, comparing the present findings to that observed from the beginning of the pandemic in Ghana, particularly, focusing on participants that were generally at the lower end of the educational status indicated that the level of adherence revealed by this study was high than during the onset of the pandemic [15].

The present findings showed that self-driven factors do not enhance adherence as much as externally driven factors do. More so, both were not as much as COVID-19 related information that indicated how each individual and/or related loved ones were at high risk of infection or an undesirable outcome (Table 8). Ning et al. [16]. reported that communication is very essential for the public to obtain knowledge and comply with COVID-19 interventions, however, they did not report such nuances [16]. Therefore, communication on COVID-19 related prevention, particularly, in respect of the current efforts at the control of transmission (or control of the next wave of infections, if it should occur) and during the ongoing vaccination should avoid giving the impression that individuals were living at their own risk, and will have to act as they will to protect themselves and to protect others. Rather it should focus on how the evolving COVID-19 situation and new facts put individuals, their loved ones, and other groups they care about in immediate danger and foreseeable high risk of undesirable outcomes. Dryhurst et al. [17] indicated that people are generally less tolerant of risks arising from new, unfamiliar knowledge than they are of risk arising from familiar or usual information. Thus, other studies on COVID-19 had reported similar results with more nuances [18, 19]. Traditionally, when self-driven factors do not do much, particularly, in cases of populations at risk, the need for some level of enforcement or mandatory action may be necessary. Such paternalism to avert large population-level harm may not be ethically impermissible [20].

Conclusion

The levels of knowledge on the cause, symptoms and preventive protocols of COVID-19 among respondents were adequate to enhance the control of the transmission or spread of COVID-19. It is also confirmatory that there was a low level of active infection among the categories of the population with similar demographics in this study and that asymptomatic cases may form an appreciable proportion of cases in Ghana. Furthermore, the findings of this study suggest that there is a need to improve the perceptions and related attitude towards adherence to prevention protocols. Perception of prevention by other means other than the prevention protocols, although prevalent did not affect the adherence to the prevention protocols, rather it served as an additional means of prevention. The study showed that the attitudes of respondents towards communication on COVID-19 are enhanced by new COVID-19 related information much more than other people's behaviour and more than self-driven factors.

Educators of the public on COVID-19 should seek to improve knowledge on the lesser appreciated symptoms which were determined in this study to be the less severe and non-specific like the initial symptoms such as fever and headache, and seek to improve perceptions and attitudes with more specific COVID-19 information that show a high risk of severity of the outcome. Additionally, public health communicators and implementers should work to ensure that adherence to prevention protocols should not be relegated to self-driven behaviour of the populace, albeit a stricter level of enforcement is needed.

Declarations

Funding Statement

No funding was received for conducting this study.

Conflicts of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethics Approval

The study was performed in line with the principles of Declaration of Helsinki. The questionnaire and methodology for this study was approved by the Ethical Review Committee of the Radiological and Medical Sciences Research Institute of the Ghana Atomic Energy Commission (RAMS/ERC/SS/04/2020).

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Consent for publication

Additional informed consent was obtained from all individual participants for whom identifying information is included in this article.

Availability of data and material

Data is available from the Supplementary material file and from the corresponding author upon request.

Code Availability

Not applicable

Authors' Contribution

AKA, EDD, DNA and EA contributed to the conceptualization of the study, development and design of methodology including the creation of the study tool and Investigation. AKA performed data curation,

formal analysis, and interpretation, and was involved with writing the original draft manuscript. EDD was involved with writing the original draft manuscript. AKA, EDD, DNA and EA reviewed the manuscript and approved it for submission.

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