

Knowledge, Attitudes and Practices towards COVID-19 among Senior High School Students within the Lower Manya Krobo Municipality in the Eastern Region of Ghana

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This work was carried out in collaboration with all authors. PA and EKS participated in conceiving the study and in the development of data collection tools. PA carried out data collection. PA and EKS participated in the data analysis and drafting of the manuscript. All authors read and approved the final manuscript.

Abstract: ***Background:** The COVID-19 has ravaged the world since its incidence in the year 2019 in Wuhan, China. Its incidence was accompanied by high levels of morbidities and mortalities, thus, creating a shakeup in various health systems across the globe and with little information on knowledge, attitudes, and practices towards COVID-19 in Ghana and no information on KAP towards COVID-19 in Lower Manya Krobo Municipality, this study is to explore the KAP of Senior High School student's towards COVID-19 to inform policy to guide schools as they reopen. **Methods:** This was a quantitative cross-sectional study conducted in the Lower Manya Krobo Municipality of Ghana between January to March 2021 among 441 randomly selected Senior High School Students using a modified structured questionnaire that had four (4) sections as adapted from Peng et al., (2020). The average age of the study participants was 17±2 years. Analysis was done using Chi-square estimation and Multivariate logistic regression models with a p-value < 0.05 as the threshold for statistical significance respectively. A linear correlation test between KAP was also carried out. **Results:** Out of 441 students, 241 (54.65%) were females, 343 (77.78%) attended public senior high school and 213 (48.30%) were in their second year. The majority of the students (32.43%) were in the General Arts program among whom 57.37%, demonstrated good knowledge, 29.48% good attitude, and 76.87% good practices. There was a positive linear correlation between knowledge and attitude, attitude and practice, and knowledge and practice. Students in the private schools were less likely to have a poor knowledge compared to their counterparts in the government schools [OR=0.189, 95% CI=0.05-0.65] and students in the boarding house were less likely to demonstrate poor practices toward COVID-19 preventive measures compared to their counterparts who stayed at home [OR=0.545, 95% CI=0.23-0.91] as no variable was statistically significant for the attitudes of students towards COVID-19. **Conclusion:** Senior high school students in the Lower Manya Krobo Municipality showed a good level of knowledge, and practice as well as a bad level of attitudes towards COVID-19. Their knowledge levels directly affected their attitudes and practice levels. Students in the private schools had good knowledge about COVID-19 and students in boarding houses demonstrated good practices in prevention of the spread of COVID-19.*

Keywords: Knowledge, Attitudes, Practices, COVID-19

1. Introduction

The COVID-19 pandemic since its ravage has negatively affected a greater percentage of students in various aspects, particularly with the closing down of schools which was least expected by students, parents as well as teachers. This meant a loss of classroom lessons altogether for some and others switched to online learning and frequently dealt with internet connectivity challenges (Upoalkpajor & Upoalkpajor, 2020). These problems pointed to a life-threatening gap in school-based activity arrangements within the wider education sector and its alternative management planning.

The availability of an anti-SARS-CoV-2 vaccine may not be enough to eradicate the COVID-19 outbreak, however, the vaccine, preventive protocols together with some effective treatments is the world's best bet for survival (Li et al., 2020). Students' going back to school means that the Ghana Education Service, Ministry of Health, and Management of Schools must make sure students have

enough knowledge about COVID-19 and are able to put up the best prevention practices for schools to thrive.

The purpose of the study was to evaluate the knowledge level of students with respect to COVID-19, to assess how their knowledge level affects their attitudes and practices, and to analyze the factors that influence their knowledge, attitudes, and practices towards COVID-19. The outcome of this study will enable the government to implement policies to guide the management of schools and students as schools reopen in the face of the pandemic.

2. Methodology

A structured questionnaire was used to collect data from the sample population using the interview method. This involved a face-to-face interviewer-interviewee encounter where the interviewer read the questions out for the interviewee to provide the answers.

The data collection instrument was a modified version of the questionnaire used by Peng et.al, (2020) in a similar

study conducted in China for students. All of the questions were close-ended questions. It took an average of 7 minutes to administer each questionnaire which consisted of four (4) sections under the broad themes of social demographics, knowledge, attitudes and practices. The demographic section collected data on the demographic characteristics of the respondents. The other aspects provided data on participant's knowledge, attitudes and practices towards COVID-19 and its prevention protocols.

2.1 Sample size

A sample was taken to represent the population of Senior High School students within the Lower Manya Krobo Municipality. To achieve that, the Cochran formula was employed to calculate adequate sample size (Cochran, 1977);

$$n = \frac{z^2 \times pq}{e^2}$$

Where n = sample size

p = prevalence on knowledge on COVID-19; literature reviewed so far did not provide any prevalence on knowledge towards COVID-19 in Ghana. Cochran, (1977) opined that, in such a situation, a prevalence of 50% be employed.

$$q = 1 - p = 0.5$$

z = 1.96 which is the critical value

e = 0.05 which is the error margin

Therefore,

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = 384.16 \approx 384.$$

A 15% non-response rate of the sample size was estimated to be 57. This implied that the actual sample was estimated to be 384 + 57 = 441. Therefore, the sample size that was used in this research was 441 participants.

2.2 Statistical analysis

Univariate analysis involving the use of frequencies and percentages was used to describe the socio-demographic characteristics of the study participants. Chi-square tests were further used to assess the level of associations between selected socio-demographic factors and Knowledge, attitudes, and practices. Finally, multivariate logistic regression models with a statistically significant value set at p-value < 0.05 were conducted on selected predictor variables using "Poor Knowledge", "Poor Attitudes" and "Poor Practices" as the dependent variables for separate binomial multivariate logistic regression. Data were analyzed using StataCorp. 2007. Statistical Software. Release 14. StataCorp LP, College Station, TX, USA.

3. Results

Of all the study participants, 241/441 (54.65%) were females and 200/441 (45.35%) were males; 98/441 (22.22%) attended private senior high schools and 343/441 (77.78%) attended public senior high school.

There were 104/441 accounting for 23.58% of the study participants in the first year of which 2/104 were in the private school and 102 were in the public school, 213/441 accounting for 48.30% in the second year of which 21/213 were in the private school and 192/213 were in the public and 124/441 accounting for 28.12% of which 75/124 were in the private school and 49/124 were in the public senior high schools. Among the study participants, 9.07%, 15.87%, 32.43%, 16.55%, 9.75%, 6.58%, 8.62%, and 1.13% read Agriculture, Business, General Arts, Home economics, Science, Technical, Visual arts, and Vocational programs respectively.

The study participants were between 14-31 years old, with a mean age of 17±2.1 years. The analysis of the age distribution showed that most of the students fall within the ages of 14-22 years old with the ages 23, 24, 25, 27, and 31 years acting as outliers as shown in Fig.2 below.

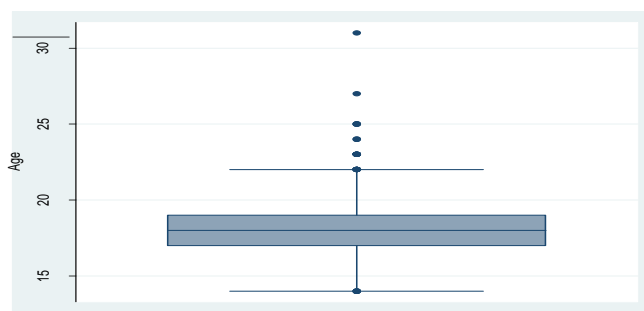


Figure 2: Age distribution of study participants

Among the study subjects 73.24%, 12.93%, and 13.83% came from peri-urban, rural, and urban settlements respectively; 54.88%, 13.83%, 20.18%, 7.48%, and 1.81% belonged to the Adangme, Akan, Ewe, Ga, and Hausa ethnic groups respectively with 1.82% of them belonging to other tribes (i.e. Busanga, Dagati, Dagomba, Fante, Guan, Kokomba and Sisala); 95.69% of them were Christians, 3.85% of them were Muslims and 0.45% of them practice the Traditional religion; 240/441 (54.42%) were boarders and 201/441 (45.58%) were day students.

3.1.1 Students' Knowledge on COVID-19

The majority of the study participants 288 (65.31%) believed that COVID-19 is caused by a viral agent, 403 (91.38%) knew that the main route of transmission of COVID-19 is through respiratory droplets and close contact and 294 (66.67%) were aware that the virus (coronavirus) responsible for COVID-19 has an incubation period of 1-14 days. Among the study participants, only 33 (7.48%) did not know that everyone is generally susceptible to COVID-19, 110 (24.94%) either did not know or stated other symptoms aside fever and cough as the main symptoms of COVID-19, 254 (58.37%) either did not know or thought there was a cure for COVID-19 and only 47 (10.66%) were not aware that a vaccine had been created for COVID-19. About seventy-six percent (75.96%) of the study participants knew that the COVID-19 cases were increasing at the time of the survey, 91.61% knew that the COVID-19 cases will increase if the prevention protocols were not adhered to

and 60.54% were aware there was a new strain of the coronavirus (**Table 1a**).

Table 1a: Knowledge of COVID-19

Variable categories	Options	Determination (Score)	N (%)
K1: What type of infectious Disease is COVID 19?	Bacterial. Viral. I don't Know.	Incorrect (0) Correct (1) Incorrect (0)	102 (23.13) 288 (65.31) 51 (11.56)
K2: What is the main transmission route of COVID 19?	Respiratory droplets and close contact. Water. Food. Sexual. I don't know.	Correct (1) Incorrect (0) Incorrect (0) Incorrect (0) Incorrect (0)	403 (91.38) 6 (1.36) 3 (0.68) 3 (0.68) 26 (5.90)
K3: How long is COVID 19 incubation period?	1 - 14 days. 3 - 7 days. More than 14 days I don't know.	Correct (1) Incorrect (0) Incorrect (0) Incorrect (0)	294 (66.67) 42 (9.52) 68 (58.42) 37 (8.39)
K4: Who is susceptible to COVID 19?	Only the old and young. Everyone is generally susceptible. Only young adults. Only people with pre-existing diseases. I don't know.	Incorrect (0) Correct (1) Incorrect (0) Incorrect (0) Incorrect (0)	12 (2.72) 408 (92.52) 1 (0.23) 13 (2.95) 7 (1.59)
K5: What are the main Clinical manifestations Of COVID 19?	Fever and dry cough. Fatigue. Stuffy and runny nose. Sore throat and myalgia. Diarrhea. I don't know.	Correct (1) Incorrect (0) Incorrect (0) Incorrect (0) Incorrect (0) Incorrect (0)	331 (75.06) 6 (1.36) 38 (8.62) 39 (8.84) 2 (0.45) 25 (5.67)
K6: COVID 19 has a cure.	True. False. I don't know.	Incorrect (0) Correct (1) Incorrect (0)	182 (41.04) 188 (42.63) 72 (16.33)
K7: A vaccine has been created for COVID 19.	True. False. I don't know.	Correct (1) Incorrect (0) Incorrect (0)	394 (89.34) 18 (4.08) 29 (6.58)
K8: As of now, the number of COVID 19 infected people in Ghana is:	Increasing. The same. Decreasing. I don't know.	Correct (1) Incorrect (0) Incorrect (0) Incorrect (0)	335 (75.96) 7 (1.59) 58 (16.42) 31 (7.03)
K9: When COVID 19 preventive measures are not adhered to:	A number of infected people increases. A number of infected people decreases. I don't know.	Correct (1) Incorrect (0) Incorrect (0)	404 (91.61) 20 (4.54) 17 (3.85)
K10: Are you aware there are New strains of the coronavirus?	Yes. No. I don't know	Correct (1) Incorrect (0) Incorrect (0)	267 (60.54) 112 (25.40) 62 (14.06)

3.1.2 Students' Attitude towards COVID-19

More than half (58.05%) of the study participants were not scared of human to human transmission of COVID-19 infection and felt they can protect themselves, 93.65% hoped that the pandemic ends so that school activities

return to normal, and only 44.44% were confident that they could maintain all COVID-19 protocols for more than two (2) years and 76.87% felt the outbreak has affected their studies. Among the study participants, only 27.13% stated that they would avoid individuals who once had COVID-19 infection (**Table 1b**).

Table 1b: Attitudes towards COVID-19

Variable categories	Options	Determination/Score	N (%)
A1: Are you scared by human-to-human transmission of COVID 19?	No. I can protect myself. I don't care; I feel the same. Yes. I'm in a panic and don't know what to do.	Good (2) Neutral (1) Bad (0)	256 (58.05) 19 (4.31) 166 (37.64)
A2: Do you hope the outbreak ends so that school activities return to normal?	Yes. I don't know. No.	Good (2) Neutral (1) Bad (0)	413 (93.65) 11 (2.49) 17 (3.85)
A3: Do you think you can maintain all COVID 19 protocols for more than 2 years?	Yes. I can. I will try. No. I can't.	Good (2) Neutral (1) Bad (0)	196 (44.44) 148 (33.56) 97 (22.00)
A4: Do you think this COVID 19 has impacted your studies?	Yes, it has. No, it has not.	Bad (0) Good (2)	339 (76.87) 102 (23.13)
A5: What would you do if someone Cured of COVID 19 wanted to meet you?	I will meet them and show more kindness. I will meet them just like before. I will find an excuse to keep away.	Good (2) Neutral (1) Bad (0)	252 (57.14) 87 (19.73) 102 (27.13)

3.1.3 Practices toward COVID-19

The majority of the study participants (73.47%) indicated that they always wear their facemasks whenever they are in public, 92.52% indicated that they maintain a distance not less than 1 meter away from others when they are in public and 91.84% indicated they immediately sanitize their hands or wash their hands with soap under running

water whenever they came into physical contact with someone or shared personal belongings with others. Among the study participants, 12.70% would not want to report to school authorities if they felt symptoms of COVID-19, 9.07% do not care or do not prompt their colleagues to maintain COVID-19 prevention protocols, and 51.02% either would not or did not know if they would take a COVID-19 vaccine (**Table 1c**).

Table 1c: COVID 19 Related Practices

Variable categories	Options	Determination/Score	N (%)
P1: Whenever I chat with others in public:	I always wear a mask. I sometimes wear a mask. I do not wear a mask.	Good (2) Moderate (1) Bad (0)	324 (73.47) 115 (26.05) 2 (0.45)
P2: Whenever I interact with other people in public:	I keep a distance of at least 1 m. How close the person does not matter. I hug and touch them at all times.	Good (2) Moderate (1) Bad (0)	408 (92.52) 11 (2.49) 22 (4.99)
P3: When I come in contact with someone or personally shared belongings:	I immediately sanitize my hands or wash my hands with soap under running water. I wash my hands under running water but with no soap. It is normal and no bother to me at all.	Good (2) Moderate (1) Bad (0)	405 (91.84) 7 (1.59) 29 (6.58)
P4: What would you do if you had fever and dry cough?	Report to school authorities. Keep to myself till I get well. I don't know what to do.	Good (2) Bad (0) Bad (0)	385 (87.30) 43 (9.75) 13 (2.95)
P5: Do you prompt your colleagues to always maintain COVID 19 prevention protocols?	Yes, I do. I don't care. No, I don't.	Good (2) Bad (0) Bad (0)	401 (90.93) 8 (1.81) 32 (7.26)
P6: Would you get vaccinated as soon as there is a safe and potent vaccine?	Yes, I will. I don't know. No, I won't.	Good (2) Moderate (1) Bad (0)	216 (48.98) 53 (12.02) 172 (39.00)

3.2 Correlation between Knowledge, Attitudes, and Practices of Study Participants

A correlation analysis revealed a positive linear correlation between the knowledge score and the attitudes

score of the study participants ($r=0.2679$), a positive linear correlation between the knowledge score and practices score of study participants ($r=0.1292$), and positive linear correlation between attitudes score and practices score of study participants ($r=1.721$) (**Table 2**).

Table 2: Correlation Analysis of Knowledge, Attitude, and Practice

Between Variables	Correlation Coefficient
Knowledge & Attitude	0.2679
Knowledge & Practice	0.1292
Attitude & Practice	0.1721

3.3 Test of Association between Study Variables

A chi-square test using $p < 0.05$ as the significant level revealed that, there was no association between the gender of the study participants and their knowledge level ($p = 0.192$), there was no association between their class or level and their knowledge level ($p = 0.206$) and there was

an association between the program read by study participants and their knowledge level ($p = 0.006$). It also revealed that there was no association between the participants' home residence and their knowledge level ($p = 0.346$). However, there was an association between their knowledge level and their school residence status ($p = 0.020$) and school type ($p = 0.01$) (**Table 3a**).

Table 3a: Bivariate Analysis of Selected Variables on Knowledge Level

Indicators	Knowledge Level			P-Value
	Good N = 253	Moderate N = 138	Poor N = 50	
Gender				
Male	106	67	27	0.192
Female	147	71	23	
Class/ Level				
SS1	59	33	12	0.206
SS2	112	74	27	
SS3	82	31	11	
Program				
Agriculture	16	16	8	0.006
Business	31	30	9	
General Arts	91	36	6	
Home Econs.	51	18	4	
Science	26	15	2	
Technical	12	9	8	
Visual Arts	23	13	2	
Vocational	3	1	1	
Home Residence				
Peri-Urban	182	105	36	0.346
Rural	33	14	10	
Urban	38	19	4	
School Residence				
Boarding	152	66	22	0.020
Day	101	72	28	
School Type				
Private	70	25	3	0.01
Public	183	113	47	

A chi-square test using $p < 0.05$ as the significant level revealed that, there was no association between any of the

selected variables and the attitude level of the study participants as shown in **Table 3b** below.

Table 3b: Bivariate Analysis of Selected Variables on Attitude Level

Indicators	Attitude Level			P-Value
	Good N = 130	Moderate N = 153	Poor N = 158	
Gender				
Male	49	79	72	0.063
Female	81	74	86	
Class/ Level				
SS1	40	30	34	0.161
SS2	58	81	74	
SS3	32	42	50	
Program				
Agriculture	10	16	14	0.352
Business	19	24	27	
General Arts	45	46	52	

Home Econs.	30	22	21	
Science	10	16	17	
Technical	2	15	12	
Visual Arts	12	12	14	
Vocational	2	2	1	
Home Residence				
Peri-Urban	95	114	114	0.954
Rural	19	21	21	
Urban	38	19	4	
School Residence				
Boarding	74	80	86	0.738
Day	56	73	72	
School Type				
Private	33	36	29	0.321
Public	97	117	129	

A chi-square test using $p < 0.05$ as the significant level revealed that, there was an association between the gender of the study participants and their practice level ($p = 0.014$), there was no association between their class or level and their practice level ($p = 0.636$) and there was an association between the program offered by study participants and

their practice level ($p = 0.006$). It also revealed that there was no association between the participants' practice level and their home residence ($p = 0.346$) and school residence status ($p = 0.565$). However, there was an association between their school type ($p = 0.031$) and their practice level (**Table 3c**).

Table 3c: Bivariate Analysis of Selected Variables on Practice Level

Indicators	Attitude Level			P-Value
	Good N = 339	Moderate N = 58	Poor N = 44	
Gender				
Male	142	36	22	0.014
Female	197	22	22	
Class/ Level				
SS1	81	10	13	0.636
SS2	161	31	21	
SS3	97	17	10	
Program				
Agriculture	28	9	3	0.006
Business	53	9	8	
General Arts	113	18	12	
Home Econs.	68	3	2	
Science	26	6	11	
Technical	21	6	2	
Visual Arts	26	6	6	
Vocational	4	1	0	
Home Residence				
Peri-Urban	251	37	35	0.283
Rural	40	11	6	
Urban	48	10	3	
School Residence				
Boarding	196	26	18	0.031
Day	143	32	26	
School Type				
Private	79	10	9	0.565
Public	260	48	35	

3.4 Variables Affecting Knowledge, Attitudes, and Practice Levels (Multivariate Logistic Regression Analysis)

Selected variables used to identify indicators or factors that affect the level of knowledge of study participants in a multivariate analysis came out as a very good model

with a general p-value ($p = 0.026$). Students who are in the private school are 0.811 times less likely to have a poor knowledge level of COVID-19 adjusting for all other variables. Meanwhile, indicators of factors such as gender, program, and school residence had no significant statistical effect in determining the knowledge level of students on COVID-19 (**Table 4a**).

Table 4a: Multivariate Logistic Regression Analysis of Selected Variables on Knowledge Level

Variable	Category	No. (%)	Odds Ratio (Unadjusted)	P-Value	95% C.I	Odds Ratio (Adjusted)	P-Value	95% C. I
Gender	Male (R)	200 (45.35)	1.000	-	-	1.000	-	-
	Female	241 (54.65)	0.643	0.148	0.35-1.16	0.999	1.000	0.48- 2.05
Program	Agric (R)	40 (9.07)	1.000	-	-	1.000	-	-
	Business	70 (15.87)	0.590	0.322	0.20-1.67	0.825	0.726	0.28-2.41
	G. Arts	144 (32.65)	0.465	0.111	0.18-1.19	0.813	0.687	0.29-2.21
	H. Econs	73 (16.55)	0.231	0.024	0.06-0.82	0.297	0.082	0.07-1.16
	Science	43 (9.75)	0.195	0.048	0.03-0.98	0.241	0.088	0.04-1.23
	Technical	29 (6.58)	1.523	0.463	0.49-4.68	1.553	0.446	0.49-4.82
	V. Arts	37 (8.39)	0.228	0.075	0.04-1.15	0.235	0.081	0.04-1.19
	Vocational	5 (1.13)	1.000	1.000	0.09-10.2	1.203	0.879	0.10-13.1
School Residence	Day (R)	201 (45.58)	1.000	-	-	1.000	-	-
	Boarding	240 (54.42)	0.650	0.158	0.35-1.18	0.652	0.192	0.34-1.23
School Type	Public (R)	343 (77.78)	1.000	-	-	1.000	-	-
	Private	98 (22.22)	0.203	0.009	0.06 -0.67	0.189	0.009	0.05-0.65

Table 4b: Multivariate Logistic Regression Analysis of Selected Variables on Attitude Level

Variable	Category	No. (%)	Odds Ratio (Unadjusted)	P-Value	95% C.I	Odds Ratio (Adjusted)	P-Value	95% C.I
Gender	Male (R)	200 (45.35)	1.000	-	-	1.000	-	-
	Female	241 (54.65)	0.968	0.873	0.65-1.43	0.957	0.830	0.64-1.42
Class/Level	SS1 (R)	104 (23.58)	1.000	0.467	-	1.000	-	-
	SS2	213 (48.30)	1.169	0.539	0.70-1.92	1.163	0.555	0.70-1.92
	SS3	124 (28.12)	1.405	0.223	0.81-2.43	1.407	0.221	0.81-2.43

Selected variables used to identify indicators or factors that affect the level of attitude of study participants in a multivariate analysis came out as a bad model with a general p-value (p=0.6666). All two variables selected i.e.

gender and class or level were not statistically significant in determining the attitude level of study participants towards COVID-19.

Table 4c: Multivariate Logistic Regression Analysis of Selected Variables on Practical Levels

Variable	Category	No. (%)	Odds Ratio (Unadjusted)	P-Value	95% C.I	Odds Ratio (Adjusted)	P-Value	95% C. I
Gender	Male (R)	200 (45.35)	1.000	-	-	1.000	-	-
	Female	241 (54.65)	0.812	0.514	0.43-1.51	1.360	0.399	0.66-2.78
Program	Agric (R)	40 (9.07)	1.000	0.009	-	1.000	-	-
	Business	70 (15.87)	1.591	0.512	0.39-6.37	1.854	0.390	0.45-7.57
	G. Arts	144 (32.65)	1.121	0.865	0.30-4.18	1.134	0.855	0.29-4.36
	H. Econs	73 (16.55)	0.347	0.258	0.05-2.17	0.317	0.237	0.04-2.12
	Science	43 (9.75)	4.239	0.038	1.08-16.5	4.866	0.026	1.21-19.5
	Technical	29 (6.58)	0.913	0.924	0.14-5.84	0.977	0.981	0.15-6.31
	V. Arts	37 (8.39)	2.387	0.245	0.55-10.3	2.619	0.201	0.59-11.4
	Vocational	5 (1.13)	1.000	-	-	1.000	-	-
School Residence	Day (R)	201 (45.58)	1.000	0.058	-	1.000	-	-
	Boarding	240 (54.42)	0.545	0.061	0.28-1.02	0.465	0.026	0.23-0.91

Selected variables used to identify indicators or factors that affect the level of practice of study participants in a multivariate analysis came out as a very good model with a general p-value (p=0.0045). Students who are in the boarding house or live on campus are 0.535 times less likely to demonstrate a poor practice level towards COVID-19 adjusting for all other variables. Meanwhile, indicators of factors such as gender and program had no significant statistical effect in determining the practice level of students towards COVID-19.

4. Discussions

A literature search on Knowledge, Attitudes, and Practices among students revealed that this study is the first study aimed at investigating the knowledge, attitudes, and practices towards COVID-19 among Senior High School student populations in the Eastern Region of Ghana. The study tool (questionnaire) that was employed was divided into four (4) sections; the first section was used to describe the demographic characteristics of the study participants, the second section was used to assess the knowledge level of the study participants, the third section was used to assess the attitude level of the study

participants and the final section was used to assess the practice level of the study participants.

4.1 Demographic Characteristics

More than 50% of the study participants were females which is consistent with a series of articles that were reviewed (Akalu, Ayelign, and Molla, 2020; Souli et al., 2020; Peng et al., 2020). The mean age of the study participants is reflective of the average age of students in the senior high school level (Ghana country report, 2015; Souli et al., 2020). However, outliers (ages 23, 24, 25, 27, and 31) were seen as a result of the fact that some private schools enrolled students in re-writing the West African Senior Secondary Certificate Examination for the second and third times. Most of the study participants attended public senior high schools and the public senior high schools had larger enrollments compared to the private schools even though there were more private schools than public schools in the study area. It was not peculiar that a higher number of the senior high school students in the Lower Manya Krobo Municipality came from a peri-urban community (73.24%) and that most of them were Adangmes (54.88%) looking at positioning of the area concerning the immediate communities around it. Most of the senior high schools within the municipality offered various forms of the General Art program with relatively higher enrollment in that program and this accounted for the higher representation of the General Art program by proportion (57.60%).

4.2 Knowledge, Attitudes, and Practices towards COVID-19

Knowledge of COVID-19 and understanding of the SARS-CoV-2 virus, its characteristics and mode of transmission, as well as, prevention of spread within the human population and animal to human transmission has improved since the incidence of the outbreak in the last quarter of 2019 (Saba et al., 2020). Participants in this study had a good general knowledge of COVID-19 as more than 50% provided correct answers to the nine (9) questions which assessed knowledge. It was only one question (K6) that had less than 50% correct answers. The generally good knowledge displayed by study participants is consistent with a KAP investigation of secondary school students in Italy (Souli et al., 2020) and this could be a result of television and radio education programs that students were exposed to during their long stay at home (Saba et al., 2020; Souli et al., 2020). The study participants generally had good attitudes per responses provided for four attitude questions (A1, A2, A4, and A5) as more than 50% of the participants provided good answers. More than 50% of the participants provided wrong responses to question A3 as most of them felt that the pandemic had affected their studies which could be a result of lack of alternative teaching and learning methods that could be employed during the major lockdown and internet connectivity problems faced by those who switched to online learning methods (Upoalkpajor and Upoalkpajor, 2020). It is worrying to note that very few of the study participants (48.98%) would like to get vaccinated when there is a potent and safe vaccine even

though most of the students demonstrated good practice levels as more than 50% of the study participants provided correct answers to practice questions P1, P2, P3, P4, and P5. This is in contrast to a vaccine acceptance survey done in Kuwait where 53.1% of the study participants said they will definitely or probably take the COVID-19 vaccine (Alqudeimat et al., 2021).

Generally, this study revealed that female students demonstrated a higher level of Knowledge, Attitudes, and Practices towards COVID-19 compared to their male counterparts. This was the same as found in a KAP study conducted on tertiary students in China (Peng et al., 2020). This could probably be because the female gender is more meticulous and health-conscious than males. In this study, it was noted that there was a positive linear correlation between the knowledge of students and attitudes; the knowledge and practices, and the attitudes and practices. This is to say that, students' knowledge of the pandemic directly affected their attitudes toward the pandemic and their adherence to the COVID-19 prevention protocols (as in practices).

4.3 Factors Associated with Knowledge, Attitudes, and Practices

The study investigated the factors or indicators that affected the level of knowledge, level of attitudes, and level of practices of senior high school students towards COVID-19. This will help public health professionals within the Lower Manya Krobo Municipality to devise plans and strategies to mitigate the spread of the coronavirus within senior high schools in the municipality and to train staff and students of senior high schools against similar public health emergencies. Chi-square test for knowledge level, practice level, and attitude level on some selected variables at a 95% confidence level and a significance level of $p < 0.05$ found that the program read by students, student's school residence status, and school type were the factors that influenced a student's knowledge on COVID-19. Students' attitudes towards COVID-19 were not affected by any other factor. However, gender, program, and school type of students were factors that affected their practice level and this could probably be because student's program of study could influence their interest in health issues as well as their health choices, student's school type might influence the effectiveness of information dissemination within the school setting and student's school residence status could influence their access to information related to COVID-19. These findings are similar to findings in Peng et al., (2020) where students' major, gender and school type directly affected their KAP levels.

4.4 Predictors of Knowledge Attitudes and Practices towards COVID-19

A variable selection for multivariate analysis used a significance level of $p < 0.2$ to select variables from the test of association to analyze how the variables affected the knowledge, attitudes, and practices level of senior high school students. It was found that students in the private senior high schools were 0.811 times less likely to have

poor knowledge of COVID-19 compared to their counterparts in the public schools. This means that private senior high school students had better knowledge of COVID-19. This is in contrast with findings by Peng et al., (2020) maybe because that study focused on tertiary students and tertiary schools are different from high schools in terms of structure and systems. This may also be attributed to the fact that private senior high schools in Lower Manya Krobo Municipality have relatively fewer students and it is easier to pass information to students in such a system. This study also revealed that students who are in the boarding facility are 0.535 times less likely to have a poor practice of COVID-19 prevention protocols compared to their counterparts who come from home (day-students). This is very much expected as students' activities on campus are closely controlled and monitored by teachers.

5. Conclusion

Most senior high school students in the Lower Manya Krobo Municipality had good knowledge and good practice levels towards COVID-19. However, very few of the students demonstrated good attitude levels towards the COVID-19. It is, therefore, necessary, that stakeholders in health and education design and use appropriate targeted messaging to further increase the knowledge level of students about COVID-19, since the study also found out that, their knowledge level directly influenced their attitudes and practices levels. The study also found that students who are in the private schools have better knowledge of COVID-19 and those in the boarding house demonstrated better practices toward COVID-19. Health workers and management of schools must design strategies that will seek to bring the public school students, especially those that commute from home to come at par with knowledge of COVID-19 and practices toward COVID-19 respectively.

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