Knowledge, attitude, and practice towards COVID-19 prevention among clients attending antenatal care at Adama hospital medical college, Adama, Ethiopia: a cross-sectional study

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Abstract

Background: In Ethiopia, an already overwhelmed health system with many sporadic outbreaks is now threatened by the COVID-19 epidemic. People with certain health conditions have a higher risk of severe complications if they acquire the infection. Pregnancy is among these conditions. To guarantee successful disease control, the knowledge, attitudes, and practices people hold toward the disease play an integral role.

Objectives: This study aimed to determine the knowledge, attitude, and practice toward COVID-19 prevention among antenatal care clients of Adama Hospital Medical College, Adama, Ethiopia.

Methods: An institution-based cross-sectional study was conducted from May 17, 2021, to May 31, 2021. The total sample size was 302. A systematic random sampling technique was used to determine the study units. The data were collected using a structured questionnaire. SPSS version 26 was used for analysis to summarize the data by frequency, percentage, and mean.

Results: Most of the respondents (74.3%) were in the age group of 18-29. The majority of the respondents were urban residents (93.8%) and married (97.3%). Among the respondents, 222 (75.3%) had good knowledge, and only 2 (0.7%) had poor knowledge status about COVID-19 prevention. About half of the respondents, 131 (44.9%) had a neutral attitude while 2 (0.7%) had a negative attitude. Nearly half of the respondents (46.9%) were not willing to take the vaccine. The prevalence of poor COVID-19 prevention practices was 61 (20.9%). Nearly half of the respondents, 136 (46.6%) had a moderate level of practice.

Conclusion: A noteworthy number of respondents had a neutral attitude. The prevalence of poor practice toward COVID-19 prevention was high. Also, the number of respondents who were not willing to take the vaccine was enormous. A preventive attitude should be reinforced by all stakeholders. Parallel to awareness creation, appropriate prevention and control strategies should be promoted to improve prevention practices.

Keywords: ANC, Attitude, COVID-19, Ethiopia, Knowledge, Practice

Background

At the end of 2019, Wuhan City, the capital city of Hubei province in China, experienced a new coronavirus outbreak (1). Thereafter, the International Committee on Taxonomy of Viruses named the virus Severe Acute Respiratory Syndrome Coronavirus 2 on February 11, 2020, and the disease COVID-19 (2-4). As the infection has spread to over 216 countries, the World Health Organization (WHO) declared the COVID-19 eruption a Public Health Emergency of International Concern on 30th January 2020 and declared the COVID-19 outbreak a global pandemic on March 11, 2020 (5-9). The pandemic presented extra pressure and overstretched the healthcare system that is already reached the breaking point throughout the world (10). It has led to a dramatic loss of human life worldwide and presents an unprecedented challenge to public health, food systems, and the world of work. The economic and social disruption caused by the pandemic was devastating. Globally, as of 21 June 2023, there have been 768,187,096 confirmed cases of COVID-19, including 6,945,714 deaths, reported to WHO (11).

People with certain health conditions have a higher risk of severe complications if they acquire the infection. These health conditions include chronic obstructive pulmonary disease and asthma, heart conditions, and immune system conditions such as human immunodeficiency virus, cancer, obesity, diabetes, kidney disease, liver disease, aged people, and pregnant women (12).

The knowledge, attitudes, and practices (KAP) that people hold towards the disease play an integral role in determining a society's readiness to accept behavioral change measures from health authorities (13). The KAP of people towards COVID-19 is critical to understand the epidemiological dynamics of the disease and the effectiveness, compliance, and success of infection prevention control measures adopted in a country (8). For public health interventions to successfully promote and sustain preventive behaviors in the community, evidence of the social, cognitive, and psychological factors associated with such behaviors is needed. Prior studies on infectious disease epidemics showed that knowledge and awareness, and risk perception help motivate people to adopt preventive behaviors (14, 15). Similarly, recent studies on COVID-19 have found that knowledge, perceived controllability, optimistic beliefs, emotions, and perception of risk can all account for community preventive actions (13, 16-18).

Moreover, research has demonstrated that effective control and mitigation of COVID-19 in any country requires operational research and timely epidemiological data generated among different groups of the population (19). Pregnancy is an exciting and sometimes stressful experience. Being pregnant during a disease outbreak may add extra anxiety and concern for pregnant women and for those who provide care for them in addition to the high risk to have a severe form of the disease if they acquire the infection (20). Therefore, this study aimed to determine KAP towards COVID-19 among clients attending antenatal care (ANC) at Adama Hospital Medical College (AHMC).

Methods

Study setting, design, period, and population

An institution-based cross-sectional study was conducted in AHMC, Adama, Ethiopia from May 6, 2021, to May 31, 2021. Adama is a city in the Oromia Regional State and located along the Great Rift Valley in East Africa, 100 kilometers southeast of Addis Ababa. With a population of more than 500,000 and a total area of 29.86 square kilometers, it is one of Ethiopia's main cities. There are more than 130 private healthcare facilities in the city, along with four hospitals and eight governmental health centers. The first and only public hospital in the city is AHMC. According to AHMC's administrative office, the hospital provides care to more than 6 million people coming from four regions (Oromia, Amhara, Afar, Somali, and Dire-Dawa). The hospital has a capacity of 527 beds for admission and serves an average of 1000 patients per day in 15 Out Patient Departments (OPDs) in 10 different specialties. ANC is among the major services provided by the hospital. There are two dedicated rooms and four staff (2 nurses, and 2 physicians) for ANC services with a total capacity of serving 60 clients per day.

The source population was all clients attending antenatal care at AHMC, and the study population consisted of clients selected using a systematic random sampling technique, and all the required information was collected from this population. All ANC clients visiting the hospital during the study period were included and those who were acutely ill and unable to communicate were excluded from this study.

Sample size determination and sampling procedure

Epi Info version 7.2.4.0 software was used to calculate the sample size for a single population proportion. Since no published data showing the knowledge, attitude, and practice toward COVID-19 among ANC clients in Ethiopia was available, 50% of prevalence was used to get the maximum sample size. Considering a 95% confidence level, a 5% margin of error, and a total source population of 1150, the calculated sample size was 288. After adding a 5% non-response rate, a final sample size of 302 was determined.

A systematic random sampling technique was used to determine the study units based on the last quarter's ANC clients. The samples were systematically selected using the formula K =N/n (where K is the constant number to take the samples, N is the expected number of ANC visits and n is the desired sample size). After determining K, which was 4, the first sample taken (between 1 and 4) was selected by using a lottery method, and every 4th ANC client was selected until the required sample size was achieved.

Data collection and tools

The data was collected using a pre-tested, structured interviewer-administered questionnaire. It includes sociodemographic characteristics and questions assessing the KAP towards COVID-19 prevention which were adapted from previous studies with minor modifications (22, 23). A total of 37 questions were used to assess the knowledge of respondents. The questions had five sections focusing on the mode of transmission of COVID-19, major signs and symptoms of the disease, risk groups to develop a severe form of the disease, prevention mechanisms, and the nature of the disease. The questionnaire assessing knowledge was answered on a yes/no basis and an additional "I don't know" option. A correct answer was assigned 1 point and an incorrect/unknown answer was 0 points. The total knowledge score ranges from 0 to 37.

The attitude or perception of participants towards COVID-19 prevention was assessed by 13 questions. Each of the attitude questions had 5 points. The questions were answered with "Strongly agree", "agree", "neutral", "disagree", and "strongly disagree". There were 12 questions assessing practice which were answered as "yes" or "no". Answers favoring the prevention of COVID-19 were assigned 1 point and those not favoring were given 0 point.

Study variables

Knowledge, attitude, and practice, age, parity, occupation, marital status, educational status, residence, number of visits, and income.

Operational definition

Knowledge about COVID-19 prevention

Participants' overall knowledge was categorized, using Bloom's cut-off point (21). Knowledge was assigned as good if the score was between 80 and 100% (29.6-37), moderate if the score was between 60 and 79% (22.2-29.2), and poor if the score was less than 60% (22.2).

Attitude about COVID-19 prevention

A positive attitude was considered if the score was between 80 and 100% (52-65), neutral if the score was between 60 and 79% (39-51), and negative if the score was less than 60% (39). Bloom's cut-off point was applied (21).

Practice of COVID-19 prevention

The overall practice score was also categorized using the same Bloom's cut-off point (21). The practice was assigned as good if the score was between 80 and 100% (9.6-12), moderate if the score was between 60 and 79% (7.2-9.5), and poor if the score was less than 60% (7.2).

Data quality control

To assure the quality of data, the questionnaire was pre-tested on 5% of the targeted sample size at AHMC. Necessary modifications of the questionnaire were carried out based on the pre-test feedback. The reliability of the knowledge, attitude, and practice questionnaires was checked. Cronbach's alpha was used to check for reliability, and a score of more than 0.7 was used as a cut-off point. The data was collected under regular supervision after giving training to data collectors. Two data collectors with a diploma in nursing and a supervisor with a bachelor's degree in public health were trained for a day. The principal investigator oversaw the data collection process throughout the study.

Data Processing and Analysis

The data were thoroughly checked to ensure completeness and consistency before being cleaned and entered into the Epi info version 7.2.4.0 software. Subsequently, the data were exported to SPSS version 26 for analysis. Frequency, percentage, and mean were utilized to summarize the data.

Results

From the total sample size calculated (302), 292 pregnant women were included in the study, making the response rate 96.6%.

Socio-demographic and economic characteristics

Most of the respondents (217, 74.3%) were in the age group of 18-29. Two-thirds of the study participants were housewives. More than one-third of the respondents were attending their 1st ANC visit and the majority (72.6%) were nullipara. The socio-demographic characteristics of the study participants are presented in (Table 1).

Table 1: The socio-demographic characteristics of antenatal care clients of Adama Hospital Medical College. Adama, Ethiopia, 2021. (N=292)

Variables	Category	Frequency	Percent (%)
Age	18-29	217	74.3
	30-39	73	25.0
	≥40	2	0.7
Occupation	Government employee	34	11.6
	Non-government employee	46	15.8
	Merchant	20	6.8
	Housewife	190	65.1
	Others	2	0.7
Marital status	Single	2	0.7
	Married	284	97.3
	Separated/divorced	6	2.1
Educational status	Can't read and write	9	3.1
	Read and write	4	1.4
	Primary (1-8)	96	32.9
	Secondary (9-12)	105	36
	Diploma and above	78	26.7
Residence	Urban	274	93.8
	Rural	18	6.2
Parity	Nullipara	212	72.6
	Multipara	80	27.4
Number of visits	1	102	34.9
	2	55	18.8
	3	37	12.7
	≥4	98	33.6
Monthly income (In ETB)	<1400	8	2.7
	1400-3550	87	29.8
	3551-5000	108	37.0
	>5000	89	30.5

Knowledge regarding COVID-19

The minimum and maximum knowledge scores were 21 and 35 respectively with a mean score of 31 $\pm$ 2.73. Among the 292 study participants, 222 (75.3%) had good, and 70 (24.0%) had moderate while the rest had poor knowledge regarding COVID-19 prevention. Of the respondents, 68 (23.3%) didn't know pregnant women have a higher risk of developing a severe form of the disease if they are infected. Responses to each knowledge question are presented in Table 2.

Table 2: Response of antenatal care clients to knowledge questions regarding COVID-19 in Adama Hospital Medical College. Adama, Ethiopia, 2021.

Questions and responses	Yes n (%)	No n (%)
How could a person acquire COVID-19?		
1. Directly through breathing/ sneezing	290 (99.3)	2 (0.7)
2. Through a mosquito bite	84 (28.8)	208 (71.2)
3. Touching mouth and nose by contaminated hand	283 (96.9)	9 (3.1)
4. Through unprotected sexual intercourse	135 (46.2)	157 (53.8)
5. Through staying and playing near others	262 (89.7)	30 (10.3)
6. Not frequently washing while at work	272 (93.2)	20 (6.8)
7. Using public transport with closed windows	263 (90.1)	29 (9.9)
8. Opening doors/windows in public places	50 (17.1)	242 (82.9)
9. Frequent use of disinfectant while at work	15 (5.1)	277 (94.9)
10. By shaking/hugging anyone	290 (99.3)	2 (0.7)
Which of the following do you think are the major signs and symptoms of COVID-19?		
1. Fever	290 (99.3)	2 (0.7)
2. Diarrhea	109 (37.3)	183 (62.7)
3. Tiredness	242 (82.9)	50 (17.1)
4. Bloody sputum	62 (21.2)	230 (78.8)
5. Swelling of legs	6 (2.1)	286 (97.9)
6. Cough	285 (97.6)	7 (2.4)
7. Headache	240 (82.2)	52 (17.8)
8. Red and painful eyes	80 (27.4)	212 (72.6)
9. Sneezing/runny nose	250 (85.6)	42 (14.4)
Who is at risk of developing a severe form of the disease?		
1. Diabetic patients	286 (97.9)	6 (2.1)
2. Hypertensive patients	271 (92.8)	21 (7.2)
3. People with heart problems	267 (91.4)	25 (8.6)
4. Pregnant women	224 (76.7)	68 (23.3)
5. Cancer patients	221 (75.7)	71 (24.3)
6. Khat chewers/smokers	219 (75)	73 (25)
7. Asthmatic patients	280 (95.9)	12 (4.1)
8. People with chronic obstructive pulmonary disease	266 (91.1)	26 (8.9)
What are the current ways of prevention?		
1. Vaccination	240 (82.2)	52 (17.8)
2. Anti-viral therapy	18 (6.2)	274 (93.8)
3. Using masks	292 (100)	0 (0)
4. Frequent washing of hands	287 (98.3)	5 (1.7)
5. Staying at home	235 (80.5)	57 (19.5)
6. Frequent disinfectant	280 (95.9)	12 (4.1)
7. Staying > 2 meters from others	288 (98.6)	4 (1.4)
At which age group do you think the disease occurs?		
1. Children	217 (74.3)	75 (25.4)
2. Youth	247 (84.6)	45 (15.4)
3. Elderly	292 (100)	0 (0)

Attitude toward COVID-19 prevention

The mean score of attitudes was 52 $\pm$ 4.65. The maximum score was 63 and the minimum was 35. Of the respondents, 159 (54.5%) had a positive, 131 (44.9%) neutral, and the rest had a negative attitude toward COVID-19 prevention. Nearly half of the respondents were not willing to take the vaccine, and more than one-third didn't agree that they were at risk of acquiring the infection. Responses for specific questions are presented in Table 3.

Table 3: Response of antenatal care clients to attitude questions toward COVID-19 prevention in Adama Hospital Medical College. Adama, Ethiopia, 2021.

Questions	Responses				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	n (%)	n (%)	n (%)	n (%)	n (%)
Do you think that disease is dangerous?	2 (0.7)	2 (0.7)	14 (4.8)	38 (13)	236(80.8)
Are you worried about one of your family members can get an infection?	0 (0)	67 (22.9)	42(14.4)	101(34.6)	82(28.1)
Are you afraid to go to common places to avoid infection?	0 (0)	68 (23.3)	23 (7.9)	141(48.3)	60(20.5)
Do you think the early diagnosis improves the treatment and outcome?	0 (0)	6 (2.1)	36(12.3)	213(72.9)	37(12.7)
Do you think the isolation of the infected cases is important?	0 (0)	0 (0)	2 (0.7)	108 (37)	182(62.3)
Do you think health education is important to prevent COVID-19?	0 (0)	8 (2.7)	7 (2.4)	132(45.2)	145(49.7)
If you take precautions, can the COVID-19 infection be prevented	2 (0.7)	2 (0.7)	32 (11)	155(53.1)	101(34.6)
If you know there is a vaccine, are you willing to take it?	20 (6.8)	77 (26.4)	40(13.7)	107(36.6)	48(16.4)
Is the available information about COVID-19 in Ethiopia sufficient?	18 (6.2)	90 (30.8)	50(17.1)	102(34.9)	32 (11)
Do you think yourself at risk?	4 (1.4)	75 (25.7)	37(12.7)	152(52.1)	24 (8.2)
If you have one of the symptoms of the disease, do you go to the health facility?	4 (1.4)	12 (4.1)	8 (2.7)	191(65.4)	77 (26.4)
If you have COVID-19 symptoms, do you avoid normal activities	0 (0)	7 (2.4)	4 (1.4)	166(56.8)	115(39.4)
Do you avoid contact with infected cases?	2 (0.7)	6 (2.1)	4 (1.4)	119(40.8)	161(55.1)

Level of practice toward COVID-19 prevention

The total practice score among respondents ranged from 3 to 12. The mean score was 8.4+ 1.99. The prevalence of poor practice was 61 (20.9%). Most of the respondents (136, 46.6%) had moderate practice levels and the remaining had good practice toward COVID-19 prevention. More than half of the respondents (54.0%) reused masks and (51.4%) did not practice "physical distancing" by always remaining 6 feet/2 meters away from others. Responses for specific practice questions are presented in Table 4.

Table 4: Response of antenatal care clients to practice questions toward COVID-19 prevention in Adama Hospital Medical College. Adama, Ethiopia, 2021.

Questions	Responses	
	Yes	No
	n (%)	n (%)
Do you participate in meetings, religious activities, events, and other social gatherings or any crowded place?	178 (61)	114 (39)
In recent days, have you worn a mask when leaving home?	284 (97.3)	8 (2.7)
Do you reuse a mask?	159 (54.5)	133 (45.5)
Do you wash your hands with soap and water frequently for at least 20 seconds or use sanitizer/60% alcohol?	233 (79.8)	59 (20.2)
Do you touch your eyes, nose, and mouth frequently with unwashed hands?	104 (35.6)	188 (64.4)
Do you clean and disinfect frequently touched objects and surfaces?	174 (59.6)	118 (40.4)
Do you practice "physical distancing" by always remaining 6 feet/2 meters away from others?	142 (48.6)	150 (51.4)
Do you limit contact (such as handshakes)?	212 (72.6)	80 (27.4)
Do you eat or drink in bars and restaurants?	70 (24)	222 (76)
Do you cover your nose and mouth during coughing or sneezing with the elbow or a tissue, and then throw the tissue in the trash?	271 (92.8)	21 (7.2)
Do you prefer to stay at home, in a room with the window open?	275 (94.2)	17 (5.8)

Discussion

Currently, the alarming spread of COVID-19 is a major public issue in the world. To date, no definitive treatment for the disease has been found, emphasizing the critical importance of prevention. Effective prevention and control of COVID-19 are achieved through increasing the population's knowledge, attitude, and practice toward COVID-19.

This study revealed that about three-fourths of the respondents had good knowledge, a quarter had moderate knowledge, and only 2 had poor knowledge regarding COVID-19. The good knowledge score in this study is lower when compared to a survey among Cameroonian residents, which revealed 84.2% (24) and Nigeria (99.5%) (19).This discrepancy could be explained by variations in the cut-off values. In addition, the discrepancies might be due to differences in community awareness creation through mass media and social media.

The level of good knowledge in this study is comparable to a study done in the Amhara region where 279 (70.0%) had demonstrated good knowledge and relatively higher when compared to studies conducted among residents of Dessie and Kombolcha city administrations where 54.11% had inadequate knowledge (25), Tigray region where 42.9% of respondents were knowledgeable (26), Sidama region was 43.9% of the study participants had good knowledge (23) and Addis Ababa where only 37.2% had good knowledge (22). The level of poor knowledge is much lower than in a study conducted in Addis Zemen Hospital where the prevalence of poor knowledge was 33.9% (27). This may be due to the timing of the studies. At the time of previous studies, the virus was new,

and people were learning more about the symptoms every day. Moreover, it may also be due to the differences in the tool used for the assessment of knowledge.

This study showed that more than half of the respondents had a positive attitude while only 2 had a negative attitude and nearly half of the respondents had a neutral attitude. The level of attitude in this study is low when compared to other studies in Nigeria where 69% of respondents had a high attitude score (24), and in Addis Ababa where 60.7% of the respondents had a positive attitude (22). The differences in the level of attitude could be explained by the variations in the cut-off values and different types of tools used by the studies. The different levels of knowledge among respondents could also attribute to the discrepancy. The level of positive attitude was higher compared to a study conducted in Sidama where 37.5% of respondents had high attitudes (23). This difference might be related to variations in the study period.

More than one-third (39.7%) of the respondents didn't agree that they were at risk of acquiring the infection. This is supported by other studies. Of the study participants in Addis Zemen, 20.5% perceived that they had a very low risk of infection (27), and 24.6% of the respondents from the U.S. believed that they were not at all likely to get infected with COVID-19 (28). This perception of a very low risk of infection might be due to a poor understanding of the high infectiousness of COVID-19.

The study revealed that 20.9% of respondents had poor practice, while almost half had moderate practice and approximately one-third demonstrated good practice in COVID-19 prevention. This result was comparable to a study in the Sidama region where 24.4% of study participants had good practice levels (23). Contrary to this study, most

participants (77%) in Palestine complied with preventative measures (10), 60.8% of respondents were taking precautions (good practice) in Cameron (24), and the majority (62%) of the respondents in Amhara region had good prevention practices (29) and 59.8% of study participants in Addis Ababa had good practice to mitigate the pandemic (22).

The prevalence of poor practice in Addis Zemen was 33.9% (27) which is slightly higher than our study. The possible justification for this disparity might be a difference in sources of information, information-seeking behavior, frequency of media exposure, knowledge, phase of the outbreak in the study area, and worry related to the outbreak of study participants which leads to the variation in the application of recommended actions and behaviors to prevent COVID-19.

Generally, this level of moderate and poor practices in this study might be primarily attributed to the lack of strict prevention and control measures implemented by local government, such as banning public gatherings and enforcing people to wear a mask.

Very interestingly, during the early phase of the COVID-19 pandemic, there has been an aggressive promotion of covid19 information through the Ministry of Health and main government mass media. This led to better knowledge and preparedness about the pandemic. While there is some level of promotion, adherence to COVID-19 prevention measures appears to be lacking.

Limitations of the study

The likelihood of giving socially acceptable answers to the respondents and the use of a small sample size could be limitations of the study.
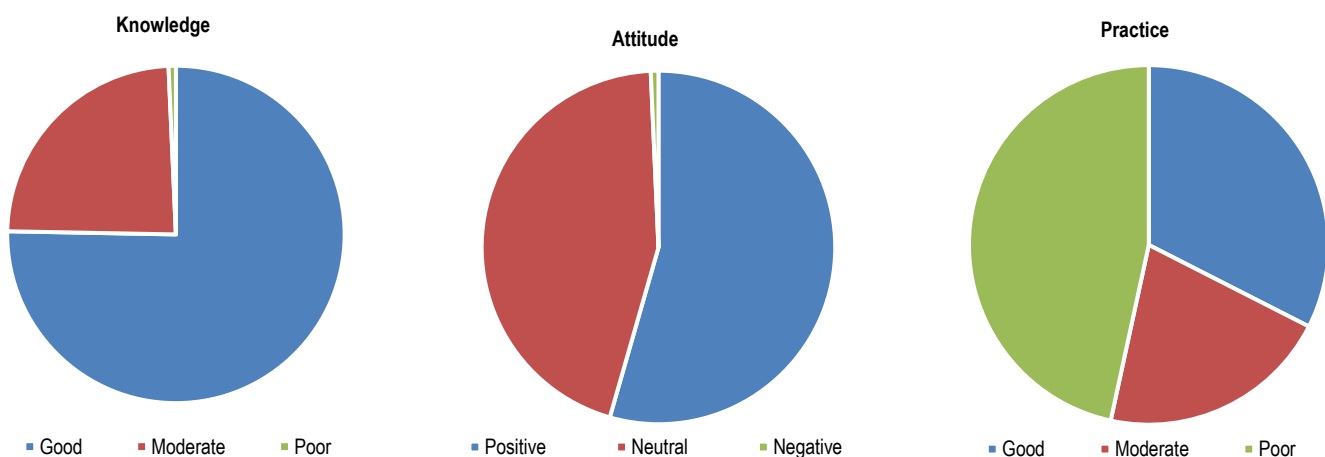
Figure 1: Knowledge, attitude, and practice towards COVID-19 prevention among clients attending antenatal care at Adama Hospital Medical College. Adama, Ethiopia, 2021.

Conclusion

In conclusion, the study findings indicate that approximately three-fourths of the respondents possessed good knowledge regarding COVID-19, and a majority displayed a positive attitude towards the disease. However, there was a significant prevalence of poor practice in terms of COVID-19 prevention. Notably, around 25% of the participants were unaware of the heightened risk faced by pregnant women in developing severe forms of the disease. Moreover, almost 50% of the respondents expressed reluctance toward COVID-19 vaccination, and over one-third did not perceive themselves as being at risk of contracting the infection.

Based on these findings, it is recommended that all stakeholders focus on reinforcing preventive attitudes and consistently promoting effective prevention and control strategies. Additionally, healthcare providers in the ANC setting should prioritize educating pregnant women about the increased vulnerability to severe illness from COVID-19. Furthermore, due to the identified resistance to vaccination, AHMC should conduct further qualitative research to better understand the underlying reasons. Overall, it is crucial to prioritize enhancing prevention practices alongside raising awareness to effectively combat the COVID-19 pandemic.

Declarations

Consent for publication

Not applicable.

Ethical declaration

Ethical clearance and supporting letters were obtained from the Ethical Review Committee of AHMC and permission was obtained from the ANC department.

Acknowledgments

Authors' contributions

TA conceived and designed the study, performed data analysis, compiled the whole work, and prepared the manuscript. NH and HD participated in the design, analysis, and review of the main document and took part in the critical revision of the manuscript. AA participated in the analysis, reviewing the main document, and took part in the critical revision of the manuscript. All authors read and approved the final manuscript.

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Competing interest

The authors declare that they have no competing interests.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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