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Original Research Article

From knowledge to action: understanding Ghanaian physicians' responses to COVID-19 pandemic threats

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ABSTRACT

Background: This study, conducted with meticulous care, aimed to determine the knowledge, perception, and preparedness of Ghanaian physicians towards a pandemic or another wave of COVID-19.
Methods: The study, conducted between May and July 2023, used a robust methodology and included a comprehensive questionnaire. The questionnaire was distributed through Facebook, WhatsApp, and other social media links, ensuring a broad reach and diverse participation.
Results: A total of 777 physicians responded, and participation was from all 16 regions of Ghana. Of these, 372 (47.9%) were males, while 405 were females (52.1%). The survey, consisting of 55 questions about COVID-19 knowledge, 29 questions about perception, and 21 questions about preparedness, was designed to capture a comprehensive understanding. The study's inclusion criteria were limited to physicians who had direct contact with patients in medical facility settings. The findings revealed that Ghanaian physicians ranked high regarding their knowledge of COVID-19. However, their readiness to face another pandemic challenge was observed at 47% in progress. In comparison, 43% of physicians responded as done, with another 10% not being unaware of the current situation about preparedness.
Conclusions: In conclusion, this study sheds light on the nuanced responses of Ghanaian physicians to the COVID-19 pandemic threats, emphasizing the critical role of knowledge in shaping their actions. Through a qualitative exploration, we discerned a spectrum of reactions ranging from proactive measures to adaptive strategies in navigating the uncertainties of the crisis. Ghana needs a blueprint for pandemic management.

Keywords: Ghana, Physicians, Doctors, COVID-19, Knowledge, Perception, Preparedness

INTRODUCTION

The COVID-19 pandemic, a global health crisis of unprecedented scale and severity, has left an indelible mark on our world. Its rapid spread and severe health implications have necessitated immediate and coordinated responses from governments and healthcare systems worldwide.[1,2] The virus, with its high transmissibility and significant morbidity and mortality rates, posed a threat to public health on a global scale.[3] In response, countries worldwide implemented various measures such as lockdowns, travel restrictions, and social distancing guidelines to control the spread of the virus. The economic and social repercussions have been profound, leading to a

global downturn, economic recession, unprecedented unemployment rates, and heightened hardships.[4]

The population's health depends critically on having a highly trained and fearless healthcare workforce capable of adapting to the emergence of new pandemics and infections. Physicians play a crucial role in the healthcare system, serving as frontline workers responsible for diagnosing, treating, and managing patients' health conditions.[5,6] Understanding how physicians respond to public health crises like the COVID-19 pandemic is essential for informing effective strategies and interventions to support healthcare professionals and improve patient outcomes.[7]

In Ghana, where healthcare resources are often limited, the challenges posed by the COVID-19 pandemic were particularly acute. Ghanaian physicians faced many challenges, ranging from resource constraints and increased workload to psychological stress and concerns about personal safety.[8] Despite these challenges, Ghanaian physicians demonstrated remarkable resilience and adaptability, employing innovative strategies to continue providing quality patient care while safeguarding their health and well-being.[9]

One of the most significant challenges faced by Ghanaian physicians during the COVID-19 pandemic was the lack of resources. Ghana's healthcare system, already stretched thin by limited funding and infrastructure, struggled to cope with the surge in COVID-19 cases. Essential resources such as personal protective equipment (PPE), ventilators, and testing kits were in short supply, leaving healthcare workers vulnerable to infection and hampering their ability to provide adequate care to patients.[8,10,11]

However, Ghanaian physicians demonstrated remarkable resilience and adaptability in responding to the threats posed by the COVID-19 pandemic. Despite facing significant challenges, including resource constraints, increased workload, and psychological stress, Ghanaian physicians employed innovative strategies to continue providing quality patient care while safeguarding their health and well-being.[12,13] Moving forward, policymakers, healthcare institutions, and communities must continue to support and prioritize the needs of healthcare workers to ensure a robust response to future public health crises.

Objectives of the study

In the following article, we explore the knowledge, perception, and preparedness of Ghanaian physicians, lessons learned, and future pandemic outlook in the context of the COVID-19 pandemic or towards the upcoming pandemic.

METHODS

This study was conducted in Ghana, a country located in West Africa. Greater Accra, the biggest region of Ghana with the most physicians, generated more responses than the other 15 regions. Physicians from all the regions participated in this qualitative analysis. The study questionnaire was distributed through social media platforms, mainly WhatsApp and Facebook, among physicians from public and private hospitals. Precautionary measurements were implied by the collaborative programs initiated by Ghana's Ministry of Health and hospital management.

The survey was based on 55 questions related to knowledge of COVID-19. The following 29 questions were about perception, while the remaining 21 questions were about the level of preparedness. The data was collected from the respondents for three months (May-July) in 2023.

Inclusion criteria

A random technique for sampling was applied to select the participants, which only targeted physicians. This study's inclusion criterion was limited to the participation of physicians who were directly involved in treating patients in medical settings.

Exclusion criteria

The study excluded physicians who do not practice within a medical facility and directly deal with and treat patients. We also excluded all other health-related staff, such as nurses, pharmacists, midwives, and health workers.

Demographic variables, including gender, age, region, and the number of years of practice, were captured. The study's sample size was determined using an online tool called Open Epi. This tool aimed for a 95% confidence level, a standard deviation of 0.5, and a confidence interval of ±5%. All the data collected for the study were analyzed using the statistical package for the social sciences (SPSS Inc., version 22, IBM, Chicago, IL, United States), with a significance level set at $p<0.05$.

Descriptive statistics like frequency, percentages, mean, standard deviation and median were employed to present the findings. All the responses and their correlations were analyzed by using SPSS ANOVA software. The statistical correlation between the data was evaluated. The University of Health and Allied Sciences, Ho, Ghana, approved the study's ethical clearance (UHAS-REC A 5 [4] 22-23).

RESULTS

Participants from all 16 regions of Ghana responded to the questionnaire, which collected 777 responses in total. The authenticity of the data obtained was validated. All eligible study participants signed informed consent.

Table 1 describes the variables observed based on gender, age, different regions, and the physicians' experience. 372 out of 777 participants were males, compared with 405

females. Most of the participants provided positive responses and yes answers.

Table 1: Demographic characteristics.

Variables	Total numbers (%) (n=777)
Gender	
Male	372 (47.9)
Female	405 (52.1)
Age (years)	
Less than 30	147 (18.9)
31-40	336 (43.2)
41-50	225 (29.0)
Above 50	69 (8.9)
Years of practice	
Less than 5	156 (20.1)
5-9	264 (34.0)
10-14	186 (23.9)
15-19	114 (14.7)
Above 20	57 (7.3)
Region of practice	
Greater Accra	90 (11.6)
Bono	30 (3.9)
Savannah	21 (2.7)
Western North	18 (2.3)
Ashanti	117 (15.1)
Central	18 (2.3)
North East	39 (5.0)
Northern	105 (13.5)
Bono East	24 (3.1)
Upper East	18 (2.3)
Oti	30 (3.9)
Upper West	21 (2.7)
Volta	93 (12.0)
Western	33 (4.2)
Eastern Region	102 (13.1)
Ahafo	18 (2.3)

Table 2 explained the general symptoms of coronavirus among the patients. 14 questions about observed disease symptoms evaluated the physician's knowledge level.

Responses were asked for 'yes', 'no', and 'I do not know' options. The p value shows the significance of the data.

Which of the following situations are means of transmission/spread of coronavirus (COVID-19)?

The primary means adopted for preventing COVID-19 was the information about viral transmission. Researchers and scientists are still investigating the origin of the coronavirus. The COVID-19 pandemic mainly originated from the SARS-CoV-2 virus.[14] However, much evidence suggests that the transmission of coronavirus from bats to humans was first done in Wuhan, a city in China. There is still a lack of proper research for intermediate hosts, as this has yet to be confirmed. Further ongoing studies are still being conducted to understand viral transmission better.[15,16] The information below is related to the transmission of coronavirus questions to investigate the knowledge level of physicians across Ghana.

Severity of the coronavirus (COVID-19)

The severity of the disease depends upon the rate of death and cure. The coronavirus spreads from one country to another mainly through travelling, causing the disease to be severe worldwide. A physician's knowledge of the earlier symptoms of the disease is essential for diagnosing the disease before the confirmatory tests.

Knowledge about contagion prevention/precaution measures

The primary precaution against COVID-19 transmission was maintaining personal hygiene, social distancing, and a healthy lifestyle. Washing hands properly repeatedly proved effective during the pandemic. Physicians recommend precautionary measurements to patients if they have enough knowledge about those measurements. Thus, the following questions related to prevention were asked and analyzed.

Perception of the physicians toward COVID-19

Participants' responses compiled with the risk of perception toward coronavirus show significant values. The responses were collected as yes, no, and I don't know. These responses are presented in Table 3. The preparedness level of the physicians was analyzed by done, in progress and I don't know options. The responses show significant data (Table 4).

Table 2: General knowledge symptoms of COVID-19.

Symptoms and responses	Physicians	P value
Fever		
Yes	750	
No	27	<0.001
I don't know	0	
Runny nose		
Yes	711	
No	63	<0.001
I don't know	3	

Continued.

Symptoms and responses	Physicians	P value
Sore throat		
Yes	735	
No	42	<0.001
I don't know	0	
Joint and muscle pain		
Yes	682	
No	87	<0.001
I don't know	8	
Shaking chills		
Yes	682	
No	89	<0.001
I don't know	6	
Shortness of breath		
Yes	723	
No	54	<0.001
I don't know	0	
Diarrhea		
Yes	591	
No	162	<0.001
I don't know	24	
Fatigue		
Yes	704	
No	72	<0.001
I don't know	1	
Dry cough		
Yes	726	
No	48	<0.001
I don't know	3	
Nasal congestion		
Yes	683	
No	91	<0.001
I don't know	3	
Weight loss		
Yes	660	
No	96	<0.001
I don't know	21	
Stomach discomfort		
Yes	573	
No	174	<0.001
I don't know	30	
Difficulty sleeping		
Yes	695	
No	79	<0.001
I don't know	3	
The incubation period is 5–14 days		
Yes	741	
No	27	<0.001
I don't know	9	
Which of the following situations are means of transmission/spread of coronavirus (COVID-19)?		
Symptoms		
Coughing or sneezing near people infected with the coronavirus (COVID-19)		
Yes	699	
No	78	<0.001
I don't know	0	

Continued.

Symptoms and responses	Physicians	P value
Go to areas/countries affected by coronavirus (COVID-19)		
Yes	678	<0.001
No	93	
I don't know	6	
Touching objects or surfaces that have been in contact with someone who has the virus		
Yes	720	<0.001
No	57	
I don't know	0	
Shake hands with someone who has an active case of coronavirus (COVID-19)		
Yes	708	<0.001
No	63	
I don't know	6	
Being on the same plane with someone with coronavirus (COVID-19)		
Yes	708	<0.001
No	66	
I don't know	3	
Eating food prepared by someone infected or exposed to the coronavirus (COVID-19)		
Yes	636	<0.001
No	126	
I don't know	15	
Participate in blood transfusions		
Yes	162	<0.001
No	564	
I don't know	51	
By relating to people who were in a hospital or emergency room		
Yes	471	<0.163
No	300	
I don't know	6	
Relating to cases identified by doctors		
Yes	672	<0.001
No	99	
I don't know	6	
About cases identified during evaluations at entry points to my country		
Yes	684	<0.001
No	81	
I don't know	12	
Severity of the coronavirus (COVID-19)		
It can be cured		
Agree	354	<0.001
Disagree	348	
Not sure	75	
It is highly contagious		
Agree	696	<0.001
Disagree	9	
Not sure	72	
The coronavirus mortality rate is worse than that of influenza or tuberculosis		
Agree	696	<0.001
Disagree	30	
Not sure	51	
COVID-19 causes permanent physical damage to patients		
Agree	603	<0.001
Disagree	90	
Not sure	84	

Continued.

Symptoms and responses	Physicians	P value
You have symptoms similar to common flu and influenza		
Agree	720	<0.001
Disagree	9	
Not sure	48	
My community/country does not have a coronavirus vaccine		
Agree	261	<0.001
Disagree	288	
Not sure	228	
My community/country does not have adequate medicine or treatment for the disease		
Agree	324	<0.001
Disagree	270	
Not sure	183	
Hospitals in my community/country have not taken adequate infection control measures		
Agree	270	<0.001
Disagree	300	
Not sure	207	
Coronavirus impact is worse compared to influenza or common cold		
Agree	669	<0.001
Disagree	36	
Not sure	72	
The authorities of my country are prepared to face the disease		
Agree	543	<0.001
Disagree	27	
Not sure	207	
The response of the health authorities of my country/community is effective		
Agree	525	<0.001
Disagree	30	
Not sure	222	
Knowledge about contagion prevention/precaution measures		
Washing hands vigorously (soap/water) for 20 seconds helps prevent disease		
Agree	732	<0.001
Disagree	18	
Not sure	27	
Special care should be taken if a person has coronavirus (COVID-19) symptoms in my community		
Agree	714	<0.001
Disagree	0	
Not sure	63	
Personal hygiene		
Agree	723	<0.001
Disagree	0	
Not sure	54	
Healthy lifestyle		
Agree	705	<0.001
Disagree	3	
Not sure	69	
Daily temperature monitoring		
Agree	663	<0.001
Disagree	33	
Not sure	81	
Avoid travelling abroad		
Agree	333	<0.001
Disagree	357	
Not sure	87	

Continued.

Symptoms and responses	Physicians	P value
Use of mask		
Agree	690	
Disagree	6	<0.001
Not sure	81	
Clean environment		
Agree	720	
Disagree	0	<0.001
Not sure	57	
Stay home if one is experiencing symptoms of COVID-19		
Agree	693	
Disagree	15	<0.001
Not sure	69	
Seek medical attention if one is experiencing symptoms of COVID-19		
Agree	708	
Disagree	0	<0.001
Not sure	69	
Avoid crowded places		
Agree	705	
Disagree	0	<0.001
Not sure	72	
Sending passengers with coronavirus symptoms (COVID-19) to a hospital or referral center for examination		
Agree	708	
Disagree	6	<0.001
Not sure	63	
Use a disinfectant at home or work		
Agree	717	
Disagree	0	<0.001
Not sure	60	
Confirm symptoms on any website		
Agree	636	
Disagree	42	<0.001
Not sure	99	
Wore something to clean objects that may have come in contact with someone with coronavirus (COVID-19)		
Agree	684	
Disagree	18	<0.001
Not sure	75	
Avoid Asian restaurants or shops		
Agree	162	
Disagree	510	<0.001
Not sure	105	
Cancel appointments in hospitals or doctor's offices		
Agree	303	
Disagree	399	<0.001
Not sure	75	
Avoid public transportation		
Agree	657	
Disagree	18	<0.001
Not sure	102	
Antibiotics are the first-line treatment for the management of coronavirus (COVID-19)		
Agree	654	
Disagree	72	<0.001
Not sure	51	
Preparation of raw meats and other foods with different knives		
Agree	183	
Disagree	453	<0.001
Not sure	141	

Table 3: Perceived susceptibility to COVID-19.

Questions and responses	Physicians	P value
Do you think there is a stigma related to the coronavirus (COVID-19)		
Yes	600	<0.001
No	171	
I don't know	6	
Thinking that I could become infected with coronavirus (COVID-19) makes me nervous/anxious		
Yes	423	<0.001
No	345	
I don't know	9	
Nothing I do can stop the risk of catching me		
Yes	390	<0.001
No	378	
I don't know	9	
If I contracted the coronavirus (COVID-19), it will have serious consequences for me or my relatives		
Yes	399	<0.001
No	357	
I don't know	21	
I get upset when I think about the coronavirus (COVID-19)		
Yes	282	<0.001
No	474	
I don't know	21	
Coronavirus (COVID-19) problems will pass quickly		
Yes	420	<0.001
No	342	
I don't know	15	
Are you afraid of		
Fear of being in contact with people with flu symptoms (e.g. cough, runny nose, sneezing, fever)		
Yes	621	<0.001
No	147	
I don't know	9	
Fear of eating out (for example, street vendor centers, food courts)		
Yes	510	<0.001
No	264	
I don't know	3	
Fear of being in contact with people who have just returned from abroad		
Yes	327	<0.001
No	450	
I don't know	0	
Fear of visiting hospitals		
Yes	258	<0.001
No	519	
I don't know	0	
Perceived susceptibility to coronavirus infection (COVID-19), evaluate the possibility of contracting the disease		
Oneself		
Very likely	513	<0.001
Probable	81	
Unlikely	183	
My relatives		
Very likely	597	<0.001
Probable	120	
Unlikely	60	
People over 60 years		
Very likely	660	<0.001
Probable	102	

Continued.

Questions and responses	Physicians	P value
Unlikely	15	
Adults		
Very likely	621	
Probable	126	<0.001
Unlikely	30	
Children		
Very likely	276	
Probable	225	<0.001
Unlikely	276	
Medical services personnel		
Very likely	630	
Probable	126	<0.001
Unlikely	21	
Food vendors		
Very likely	600	
Probable	156	<0.001
Unlikely	21	
Food handlers		
Very likely	612	
Probable	153	<0.001
Unlikely	12	
General public		
Very likely	657	
Probable	117	<0.001
Unlikely	3	
Taxi drivers		
Very likely	672	
Probable	84	<0.001
Unlikely	21	
Where are people likely to get coronavirus (COVID-19)?		
Home		
Very likely	156	
Probable	180	<0.001
Unlikely	441	
Health institutions		
Very likely	675	
Probable	90	<0.001
Unlikely	12	
Public transport		
Very likely	681	
Probable	90	<0.001
Unlikely	6	
Markets or shops		
Very likely	666	
Probable	105	<0.001
Unlikely	6	
Countries affected by the coronavirus (COVID-19)		
Very likely	681	
Probable	90	<0.001
Unlikely	6	
Efficacy of treatments for coronavirus (COVID-19)		
Very likely	366	
Probable	384	<0.001
Unlikely	27	

Continued.

Questions and responses	Physicians	P value
Likelihood of having a major outbreak of coronavirus (COVID-19) from person to person in my community		
Very likely	606	<0.001
Probable	153	
Unlikely	18	
Concern that you or your family members will get the virus		
Very likely	306	<0.001
Probable	417	
Unlikely	54	
Having effective medications or remedies available		
Very likely	294	<0.001
Probable	354	
Unlikely	129	

Table 4: Level of preparedness.

Questions and response	Physicians	P value
Education/training about COVID-19 infection control and update policy as required?		
Done	378	<0.001
In progress	384	
I don't know	15	
Informational materials (e.g., brochures and posters) on COVID-19?		
Done	393	<0.001
In progress	369	
I don't know	15	
Alcohol-based hand sanitizer for hand hygiene is available in every patient room?		
Done	447	<0.001
In progress	291	
I don't know	39	
PPE available immediately outside of the patient room is provided		
Done	438	<0.001
In progress	294	
I don't know	45	
Ensuring safety in working place		
Done	351	<0.001
In progress	402	
I don't know	24	
Readiness to implement every standard precaution		
Done	354	<0.001
In progress	393	
I don't know	30	
Activities to prevent COVID-19 transmission to family members		
Done	342	<0.001
In progress	375	
I don't know	60	
Readiness for caring for febrile patients		
Done	342	<0.001
In progress	381	
I don't know	54	
Readiness of self away from family members		
Done	342	<0.001
In progress	378	
I don't know	57	
Readiness for caring for COVID-19-infected patients		
Done	360	<0.001

Continued.

Questions and response	Physicians	P value
In progress	351	
I don't know	66	
Readiness overwhelmed with the new COVID-19		
Done	336	
In progress	366	<0.001
I don't know	75	
Readiness for telling family and friends if infected with COVID-19		
Done	375	
In progress	345	<0.001
I don't know	57	
Readiness for caring for COVID-19-infected patients if their colleagues are infected with COVID-19		
Done	378	
In progress	345	<0.001
I don't know	54	
The readiness of the institution to support healthcare providers		
Done	351	
In progress	363	<0.001
I don't know	63	
Readiness for COVID-19 crisis that increased workload		
Done	342	
In progress	363	<0.001
I don't know	72	
Proper infection control training has been given		
Done	312	
In progress	420	<0.001
I don't know	45	
Support from your team members		
Done	321	
In progress	393	<0.001
I don't know	63	
Readiness that might eventually get COVID-19 at work		
Done	327	
In progress	375	<0.001
I don't know	75	
Determine a contingency staffing plan		
Done	324	
In progress	384	<0.001
I don't know	69	
Designate a point of contact for the healthcare union		
Done	333	
In progress	393	<0.001
I don't know	51	
Designate a point of contact for the family members		
Done	402	
In progress	333	<0.001
I don't know	42	

DISCUSSION

During any pandemic outbreak, doctors or physicians are at the top of the list for public health. In every nation, the obligation of public health becomes greater and contingent upon medical professionals. Physicians' mental and physical health is a significant concern during the pandemic for disease identification, precautionary measures, and promotion of healthy lifestyles to mitigate the effects of the disease.[17] In the COVID-19 pandemic, human health has unquestionably become a global concern. The viral transmission rate increased daily, and the world was at risk of disease, particularly the medical community.[18] Therefore, it is more important to investigate the knowledge and perception of physicians than the public.

The following qualitative study investigates Ghanaian physicians' knowledge, perception, and preparedness levels across all regions. Contributing participants of the study show relatively excellent knowledge (97%) of the general symptoms of COVID-19. On the contrary, young doctors lack information about their knowledge related to weight loss, stomach discomfort, difficulty sleeping, and the incubation time of the coronavirus. 74% of physicians agree with stomach discomfort as a general symptom of COVID. Furthermore, the results obtained from the study's statistical analysis indicate the link between variable factors like age groups and non-variable factors. The knowledge level of the age group of 31-40 shows the highest level of correct information about the COVID-19 pandemic.

Many other studies have already been done that support these findings and show positive feedback.[19] One such study expresses healthcare workers' poor knowledge about virus transmission. However, our study indicates that 90% of physicians agree that coughing or sneezing is a significant source of virus transmission.

Interestingly, 87 physicians did not consider joint and muscle pain as a general symptom of COVID-19, while 162 ruled out diarrhoea as a COVID-19 symptom. The response about COVID-19 being curable was strange; 354 agreed that it was curable, while 348 disagreed, and 75 stated that they did not know. Overwhelmingly, the respondents agreed that special care should be taken if a person has COVID-19 symptoms in the community and that personal hygiene was important regarding contagion prevention/precautionary measures. More physicians disagreed that travelling abroad was a necessary measure to prevent infection.

The mortality rate of health professionals during COVID-19 was increasing worldwide, leading to more fear and perceived susceptibility towards the disease. According to Beyuo et al, the fatality rate was 1.7% among doctors in Ghana.[20] However, Ghanaian physicians are more optimistic about public health and perform their duties very well. The increased level of preparedness by health communities and the government against the upcoming new wave of COVID-19 is critical to save the whole population. The preparedness level of physicians is evaluated in this specific study to improve the health facilities across the country. The overall preparedness level by the physicians was calculated as 49% as in progress.

However, physicians' readiness to face another pandemic challenge in the future was observed at 47% in progress, and 43% of physicians responded as done. Still, 10% are unaware of the current situation regarding preparedness. The responses regarding the preparedness level show that Ghana did not have everything in place to battle a pandemic.

Fortunately, this study is a separate one that focuses only on physicians and other healthcare workers like nurses, pharmacists, and midwives. Physicians are seen as frontline heroes in the pandemic.

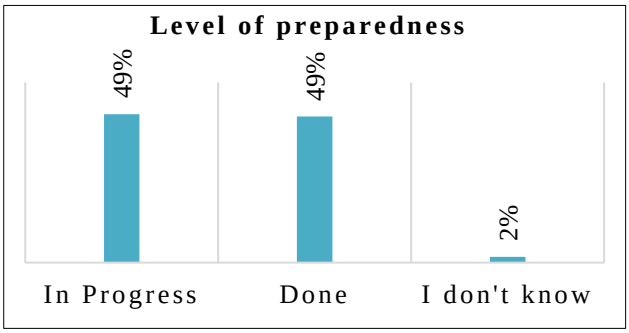

Figure 1: The level of preparedness of physicians in response to COVID-19.

Physicians' knowledge of coronavirus appears to be relatively good. The positive perception of virus transmission and less fear of perceived susceptibility to COVID-19 lead to physicians' preparedness for future pandemics in Ghana. However, there is still a prompt need to initiate collaborative programs among the government and the medical communities to meet the nationwide vaccine and personal protective equipment needs.

CONCLUSION

Importantly, our findings underscore the multifaceted nature of healthcare professionals' responses, influenced by information dissemination, resource availability, institutional support, and personal beliefs. As the global community continues to grapple with the evolving challenges posed by the pandemic, understanding and addressing the complexities of physician responses in diverse contexts like Ghana remains imperative for effective crisis management and public health interventions. This research contributes to the ongoing discourse on pandemic preparedness. It underscores the need for tailored approaches for the socio-cultural, economic, and systemic factors shaping healthcare delivery in resource-constrained settings. Ultimately, bridging the gap between knowledge and action is essential for fostering resilience and ensuring collective efforts towards mitigating the impact of future health issues. Ghana needs a carefully designed national blueprint for a pandemic. This will help streamline actions taken across the board and prevent the loss of lives and panic.

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