

Knowledge and attitude of doctors in a Nigerian tertiary hospital to the health effects of climate change: Policy implications

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Abstract

Introduction: Globally, physicians are expected to understand the threats posed by climate change and advocate for strong mitigation and adaptation strategies. This study was therefore designed to assess the knowledge and attitude of doctors at the University College Hospital Ibadan to the health effects of climate change as well as the policy implications of the findings.

Methods: A descriptive cross-sectional survey was conducted among 423 physicians who were grouped by cadre into house officers (82), medical officers (28), resident doctors (275) and consultants (38). A stratified random sampling technique was used to select respondents from the different physician cadres in the hospital. A semi-structured self-administered questionnaire was used to collect information. Knowledge and attitude were assessed using 44-point and 40-point scales respectively. Knowledge score <22 was regarded as poor. Similarly, attitude scores <25 were regarded as poor. Chi-square test and t-test were used to analyse the data at 5% level of significance.

Results: Mean age of respondents was 35.8±9.3 years, 59.3% were female. More than half (54.1%) had practiced for ≥6 years. Almost all (97.0%) were aware of climate change and the commonest source of information was television (81.1%). More than half of respondents (55.8%) had good knowledge of climate change; similarly, about half (53.7%) had good attitude towards climate change. Respondents' characteristics that were significantly associated with good knowledge and attitude included age ≤29 years, male gender, being currently unmarried, being a resident doctor and practice for ≤5 years.

Conclusion: Climate change issues should be integrated more into the continuing medical education of physicians in order to improve their knowledge and attitude to climate change matters as well as their capacity to participate in its policy analysis.

Keywords: Climate change, Physicians, Policy analysis, Nigeria

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Résumé

Contexte: Globalement, on s'attend à ce que les médecins comprennent les menaces posées par le changement climatique et préconisent des stratégies d'atténuation et d'adaptation fortes. Cette étude a donc été conçue pour évaluer les connaissances et l'attitude des médecins du Collège Hospitalier Universitaire Ibadan sur les effets sur la santé des changements climatiques ainsi que sur les implications politiques des résultats.

Méthodes: Une étude transversale descriptive a été menée auprès de 423 médecins qui ont été regroupés en officiers de maison par des cadres (72), des médecins (28), des médecins résidents (275) et des consultants (38). Une technique d'échantillonnage aléatoire stratifié a été utilisée pour sélectionner les répondants des différents cadres médicaux de l'hôpital. Un questionnaire semi-structuré auto-administré a été utilisé pour recueillir des informations. La connaissance et l'attitude ont été évaluées en utilisant des échelles de 44 points et 40 points respectivement. Le score de connaissance <22 était considéré comme médiocre. De même, les scores d'attitude <25 ont été considérés comme médiocres. Le test du Chi-carré et le test t ont été utilisés pour analyser les données à un niveau de signification de 5%.

Résultats: L'âge moyen des répondants était de 35,8 ± 9,3 ans, 59,3% étaient des femmes. Plus de la moitié (54,1%) avaient pratiqué pendant ≥6 ans. Presque tous (97,0%) connaissaient bien le changement climatique et la source d'information la plus commune était la télévision (81,1%). Plus de la moitié des répondants (55,8%) connaissaient bien le changement climatique; De même, environ la moitié (53,7%) avait une bonne attitude face au changement climatique. Les caractéristiques des répondants qui étaient significativement associés à une bonne connaissance et à une attitude incluait l'âge ≤29 ans, le sexe masculin, n'étant pas célibataire, étant un médecin résident et pratiquaient pendant plus ou moins de 5 ans.

Conclusion: Les problèmes de changement climatique devraient être davantage intégrés à la formation médicale continue des médecins afin d'améliorer leur connaissance et leur attitude à l'égard des questions liées au changement climatique ainsi que leur capacité à participer à l'analyse de leurs politiques.

Mots-clés: Changement climatique, Médecins, Analyse des politiques, Nigéria

Introduction

Climate change is long-term alteration in global weather patterns, characterised by increase in temperature and storm activity, and also regarded as a potential consequence of the greenhouse effect. Climate is the average weather over a long period of time while climate change is long-term alteration in global weather patterns, characterised by increase in temperature and storm activity, and also regarded as a potential consequence of the greenhouse effect. [1].

Climate change is increasing the burden of climate-sensitive health determinants and outcomes worldwide. Acting through increasing temperature, changes in the hydrologic cycle, and sea level rise, climate change is projected to increase the frequency and intensity of heat events and extreme events - floods and droughts [2]. It is also predicted that climate change will change the geographic range and incidence of climate-sensitive vector-, food-, and waterborne diseases, and increase diseases associated with air pollution and aeroallergens [2].

Health care professionals should understand these threats, anticipate their effects on public health, and participate as advocates for strong mitigation and adaptation strategies now. Any solutions that address climate change must be developed within the context of overall sustainability (the use of resources by the current generation to meet current needs while ensuring that the survival of future generations is not jeopardised in terms of their needs being met). Health care professionals can be leaders in a move away from a traditional focus on disease prevention and instituting appropriate therapies to a broad, integrated focus on sustainability as synonymous with health [3].

Studies have shown that health care professionals have an important role in preparing for and responding to these climate change related threats to human health particularly in participating in the policy process [3, 4]. Very few studies have been done in developing countries to assess the perception of health workers about the health effects of climate change especially in the developing countries. It is therefore important to assess the perception of the Nigerian health workers to the health effects of climate change since they are well positioned to affect public attitude on these issues [5, 6]. Thus, this study was designed to assess the perception of doctors at the University College Hospital Ibadan on the health effect of climate change. Hence, this study provides preliminary local data which could be

used to strengthen the capacity of health workers in Nigeria to manage the climate-change-related health effects.

Materials and method

The study employed a descriptive cross-sectional design involving a questionnaire survey. The study took place in Oyo State, one of the 36 States of the Federal Republic of Nigeria, located in the South-western part of the country. The state has a population of 5,591,589 with an annual growth rate of 3.2% [7].

The survey was conducted at the University College Hospital, Ibadan, the capital city of Oyo State. The hospital was established in 1952 in response to the need for the training of medical students following the establishment of the then Faculty of Medicine (now College of Medicine) in the University College, Ibadan in 1948 (currently the University of Ibadan). It serves as a major referral centre for Nigeria as a whole and many parts of the Sub-Saharan Africa.

In addition to undergraduate medical training (based in the College of Medicine of the University of Ibadan), the University College Hospital also provides facilities for residency training and other postgraduate medical and health trainings.

The study population included doctors currently in the employment of UCH, Ibadan for at least 6 months. These comprised house officers (82), medical officers (28), resident doctors (275) and consultants (38). There are about 1000 doctors practicing at various levels in the hospital. This includes about 200 Consultants, about 350 Resident doctors and Medical Officers and about 450 House Officers. Proportionate sampling of respondents was carried out. Employee list generated from the Finance Department was used to stratify doctors by cadres into house officers, medical officers, resident doctors and consultants. Using a computer generated table of random numbers, a proportionate fraction of each group was sampled. Knowledge and attitude were assessed using 44-point and 40-point scales respectively. Knowledge score <22 was regarded as poor while ≥ 22 was regarded as good. Similarly, attitude scores <25 and ≥ 25 were regarded as poor and good respectively.

Approval for this study was obtained from the University of Ibadan/University College Hospital (UI/UCH) Institutional review board (No. UI/EC/14/0152). Participation was voluntary and each respondent received detailed information on the purpose of the study. Informed verbal consent

was obtained from participants before the administration of questionnaires.

Results

A total of 423 doctors participated in the study. The mean age was 35.8 ± 9.3 years while majority, 174 (41.1%), were between 30 to 39 years. There were 251 (59.3%) females and slightly above three-fifth, 264 (62.4%), of respondents were currently married. Majority of respondents, 340 (80.4%), were Yoruba. The highest proportion, 275 (65.0%), were resident doctors while more than half of the respondents, 229 (54.1%), had practiced for 6 or more years. The mean duration of practice was 10.6 ± 9.6 years with a range of 1 – 36 years (see Table 1).

Table 1: Socio – demographic characteristics of respondents (N = 423)

Variable	Frequency (n)	Proportion (%)
Age group (years)		
≤ 29	117	27.7
30-39	174	41.1
≥ 40	132	31.2
Mean age (±SD)	35.8±9.3	
Sex		
Male	172	40.7
Female	251	59.3
Marital status		
Currently married	264	62.4
Not currently married	159	37.6
Ethnic groups		
Yoruba	340	80.4
Igbo	41	9.7
Hausa	7	1.7
Others*	35	8.3
Designation		
House officers	82	19.4
Medical officers	28	6.6
Resident doctors	275	65.0
Consultants	38	9.0
Completed years of practice		
≤ 5	194	45.9
≥ 6	229	54.1
Mean duration of practice (±SD)	10.6±9.6	

*Urhobo, Idoma, Isoko, Ishan, Ebira, Fulani, Ijaw, Ogori, Egun

Respondents' knowledge of climate change

Almost all, 410 (96.9%), of participants had heard about climate change. However, only about half, 236 (55.8%) had good knowledge of all aspects of climate change. Slightly less than three-fifth, 243 (57.4%) of respondents had good knowledge of the possible health effects of climate change while about two-

third, 276 (65.2%) had good knowledge of adaptation to climate change (Table 2).

Table 2: Composite knowledge scores on various aspects of climate change (N=423)

Knowledge variables	Frequency (n)	Proportion (%)
General knowledge		
Good	221	52.2
Poor	202	47.8
Knowledge on health effects		
Good	243	57.4
Poor	180	42.6
Knowledge on adaptation		
Good	276	65.2
Poor	147	34.8
Total knowledge		
Good	236	55.8
Poor	187	44.2

Source of information on climate change

The television was reported as the commonest (81.1%) source of information on climate change while information from colleagues (30.0%) was the least common (Figure 1).

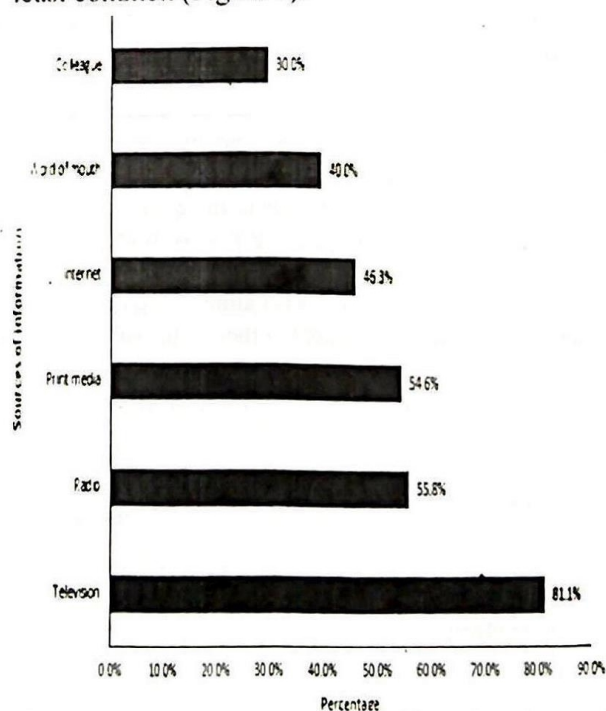


Fig. 1: Respondents source(s) of information about climate change

Knowledge of the health effects of climate change

Slightly more than a third, 159 (37.6%), of respondents knew that climate change is not the same as weather change while about the same proportion, 154 (36.4%), alluded to the fact that climate change is

not entirely a natural occurrence. More than half, 248 (58.6%), of participants agreed that climate change poses a serious problem for Nigeria (Table 3).

in some positive health effects although majority, 362 (85.6%), were aware that climate change could result in important health effects. Table 4 summarises

Table 3: Positive responses to general questions on climate change (N=423)

Climate change issues	Frequency (n)	Proportion (%)
Climate change is not the same as weather change	159	37.6
Climate change is not synonymous to global warming	267	63.1
Global warming results in climate change	335	79.2
The world's climate is changing	372	87.9
Climate change is the result of human behavior	0	0.0
Climate change is not entirely a natural occurrence	154	36.4
Climate change poses a serious problem for Nigeria	248	58.6
Greenhouse gas (GHG) emissions are very important causes of climate change	272	64.3
Methane is not the most important greenhouse gas	331	78.3
Water vapor is one of the greenhouse gases	85	20.1
Industrialization & urbanization are important causes of climate change	344	81.3
Agriculture has an impact on climate change	285	67.4
Climate change is not entirely man-made	98	23.2

Less than a fifth, 66 (15.6%), of the study's respondents knew that climate change could result

the knowledge of respondents about possible health effects of climate change.

Table 4: Positive responses to issues on health effects of climate change (N=423)

Issues on health effects of climate change	Frequency (n)	Proportion (%)
Climate change has some positive health effects	66	15.6
Climate change can result in important health effects	362	85.6
Lives are being lost globally due to the effect of climate change	329	77.8
Children and the aged are the age groups most affected by climate change	148	35.0
Climate change increases the frequency and intensity of severe weather events	359	84.9
Climate change may result in flooding of the coastal regions	327	77.3
Levels of UV radiation reaching the earth's surface may increase as a result of climate change	325	76.8
Diseases whose incidence could increase as a result of climate change		
Malaria	303	71.6
Tuberculosis	241	57.0
Diarrhoea	240	56.7
Food poisoning	163	38.5
HIV/AIDS	242	57.2
Onchocerciasis	174	41.1
Schistosomiasis	176	41.6
Leprosy	158	37.4
Dengue fever	134	31.7
Yellow fever	151	35.7
Encephalitis	152	35.9
Hypertension	170	40.2
Diseases that could be aggravated by climate change		
Cardiovascular diseases	173	40.9
Diabetes mellitus	180	42.6
Asthma	338	79.9
Malnutrition	255	60.3

Table 5: Positive responses to adaptation issues on Climate Change (N=423)

Adaptation to climate change	Frequency (n)	Proportion (%)
Improving access to cooler or air-conditioned environments is an important adaptation strategy	209	49.4
Surveillance and control of infectious diseases are climate change adaptation strategies	273	64.5
Immunization campaigns for existing and emerging health risks that target vulnerable populations are useful	317	74.9
Provision of protective shelter and clothing are important in climate change adaptation	344	81.3
Clearing of drainages and construction of floodways are important	283	66.9
Health promotion campaigns that link energies use to behavior are beneficial	297	70.2

Knowledge about adaptation to climate change

Slightly less than two-third, 273 (64.5%), of respondents opined that surveillance and control of infectious diseases are climate change adaptation strategies while about the same proportion, 283 (66.9%) agreed that clearing of drainages and construction of flood channels are also important. Table 5 sums up the knowledge of respondents on specific aspects of climate change adaptation.

agreed that healthcare professionals should understand and anticipate the health effects of climate change. Likewise, only a small proportion (6.8%) agreed that health workers should be advocates of climate change issues. Similarly, only 3.0% of respondents agreed that climate change initiatives should be integrated into MDG-based sustainable development plans. Overall, slightly above half of respondents,

Table 6: Attitudes toward the Health Effects of Climate Change

Attitude	Agree n (%)	Undecided n (%)	Disagree n (%)
Healthcare professionals have no business with climate change issues	41 (10.0)	34 (8.0)	347 (82.0)
I personally can help to limit the effects of climate change	93 (22.0)	60 (14.2)	270 (63.8)
Healthcare professionals should understand the threats and anticipate the effects of climate change on health	9 (2.1)	40 (9.5)	374 (88.4)
Health workers should participate as advocates in climate change issues	29 (6.8)	36 (8.5)	358 (84.6)
I should not be concerned about climate change issues	30 (7.1)	44 (10.4)	349 (82.4)
I have a role to play in mitigating climate change effect	36 (8.5)	79 (18.7)	308 (72.8)
Climate change initiatives should be integrated into the national MDG-based sustainable development plans	13 (3.0)	76 (18.0)	334 (79.0)
Turning appliances off and reducing waste may help mitigate the effects of climate change	34 (8.0)	73 (17.3)	316 (74.7)

Respondents' attitude to climate change and its health effect

The respondents' attitudes to various aspects of climate change are shown in Table 6. Majority of respondents (82.0%) agreed that health professionals have something to do with climate change issues. Only about one-fifth of respondents (22.0%) believed they can personally help to limit the effects of climate change. Only nine participants (2.1%)

227 (53.7%), have positive attitude score to climate change issues.

Socio-demographic characteristics and knowledge of climate change

Associations between demographic characteristics of respondents and mean knowledge of climate change are summarised in Table 7. Doctors aged 29 years and below had the highest mean knowledge

Table 7: Respondents' socio-demographic characteristics and knowledge of climate change

Characteristics	Mean knowledge score (\pm SD)	ANOVA	t-test	p-value
<i>Age group (years)</i>				
≤ 29	26.5 \pm 7.1	12.919	5.631	<0.001
30-39	23.9 \pm 7.7			
≥ 40	21.8 \pm 6.9			
<i>Sex</i>				
Male	26.4 \pm 6.7			
Female	22.3 \pm 7.6			
<i>Marital status</i>				
Currently married	22.9 \pm 7.3		-3.815	<0.001
Not currently married	25.7 \pm 7.5			
<i>Ethnic groups</i>				
Yoruba	23.9 \pm 7.6	0.897		0.443
Igbo	23.5 \pm 8.3			
Hausa	21.9 \pm 5.9			
Others*	24.0 \pm 7.5			
<i>Designation</i>				
House officers	27.8 \pm 5.6	11.679		<0.001
Medical officers	26.2 \pm 6.0			
Resident doctors	23.0 \pm 7.8			
Consultants	21.5 \pm 6.8			
<i>Completed years of practice</i>				
≤ 5	25.9 \pm 7.8		5.096	<0.001
> 6	22.3 \pm 6.8			

*Urhobo, Idoma, Isoko, Ishan, Ebira, Fulani, Ijaw, Ogori, Egun

Table 8: Respondents' socio-demographic characteristics and knowledge of the health effects of climate change

Characteristics	Knowledge score		χ^2	p-value
	Good n (%)	Poor n (%)		
<i>Age group (years)</i>				
≤ 29	78 (32.1)	39 (21.7)	5.882	0.053
30-39	96 (39.5)	78 (43.3)		
≥ 40	69 (28.4)	63 (35.0)		
<i>Sex</i>				
Male	109 (44.9)	63 (35.0)	4.163	0.041
Female	134 (55.1)	117 (65.0)		
<i>Marital status</i>				
Currently married	147 (60.5)	117 (65.0)	0.895	0.334
Not currently married	96 (39.5)	63 (35.0)		
<i>Ethnic groups</i>				
Yoruba	195 (80.2)	145 (80.6)	3.398	0.334
Igbo	23 (9.5)	18 (10.0)		
Hausa	2 (0.8)	5 (2.8)		
Others*	23 (9.5)	12 (6.7)		
<i>Designation</i>				
House officers	58 (23.9)	24 (13.3)	8.696	0.034
Medical officers	17 (7.0)	11 (6.1)		
Resident doctors	145 (59.7)	130 (72.2)		
Consultants	23 (9.5)	15 (8.3)		
<i>Completed years of practice</i>				
≤ 5	123 (50.6)	71 (39.4)	5.199	0.023
≥ 6	120 (49.4)	109 (60.6)		

*Urhobo, Idoma, Isoko, Ishan, Ebira, Fulani, Ijaw, Ogori, Egun

Table 9: Respondents' socio-demographic characteristics and mean attitude scores to climate change

Characteristics	Mean attitude score (\pm SD)	ANOVA	t-test	p-value
<i>Age group (years)</i>				
≤ 29	1.7 \pm 0.5	15.394		<0.001
30-39	1.6 \pm 0.5			
≥ 40	1.4 \pm 0.5			
<i>Sex</i>				
Male	34.4 \pm 4.8		6.027	<0.001
Female	31.4 \pm 5.1			
<i>Marital status</i>				
Currently married	31.8 \pm 5.1		-4.448	<0.001
Not currently married	34.0 \pm 5.0			
<i>Ethnic groups</i>				
Yoruba	1.5 \pm 0.5	1.225		0.300
Igbo	1.6 \pm 0.5			
Hausa	1.7 \pm 0.5			
Others*	1.6 \pm 0.5			
<i>Designation</i>				
House officers	1.8 \pm 0.4	8.109		<0.001
Medical officers	1.6 \pm 0.5			
Resident doctors	1.5 \pm 0.5			
Consultants	1.4 \pm 0.5			
<i>Completed years of practice</i>				
≤ 5	34.2 \pm 4.8		5.85	<0.001
≥ 6	31.3 \pm 5.1			

*Urhobo, Idoma, Isoko, Ishan, Ebira, Fulani, Ijaw, Ogori, Egun

score (26.5 \pm 7.14) among the study participants ($p < 0.001$). Also, male physicians had significantly higher ($p < 0.001$) climate change knowledge score (26.4 \pm 6.6) compared with the females (22.3 \pm 7.6). Marital status, designation and duration of practice of respondents were all significantly associated with higher mean climate change knowledge score ($p < 0.001$).

Socio-demographic characteristics and knowledge of health effects of climate change

Table 8 shows cross tabulations of demographic variables and the knowledge of the health effects of climate change. The highest proportion of those with good knowledge, 96 (39.5%), were aged 30 – 39 years ($p = 0.053$). Other characteristics significantly associated with good knowledge of the health effects of climate change include female gender, being resident doctors and length of practice ≤ 5 years ($p < 0.05$). Marital status and ethnic affiliation were not significantly associated with knowledge of the health effects of climate change ($p > 0.05$).

Socio-demographic variables, knowledge and attitude to climate change

The association between socio-demographic characteristics and mean attitude scores to climate change are illustrated in Table 9. Respondents aged

29 years and below, males, not currently married, house officers and those who have practiced for 6 or more years had significantly higher mean attitude scores ($p < 0.001$). Mean attitude scores among ethnic groups were not significantly different ($p > 0.05$).

Table 10 also revealed that younger age group, male gender, marital status, being a resident doctor and duration of practise were associated with positive attitude to climate change. Similarly, a greater proportion of participants with good climate change knowledge, 167 (73.6%), also had positive attitude to climate change ($p < 0.001$).

Predictors of good knowledge of climate change among respondents

Table 11 demonstrated that only sex was the significant predictor of good knowledge in this study. Male respondents were two times more likely to have good knowledge of climate change compared with the female respondents [OR: 2.1; 95%CI: 1.4 – 3.3].

Predictors of positive attitude towards climate change among respondents

The significant predictors of positive attitude to climate change following logistic regression is

Table 10: Respondents' socio-demographic characteristics and attitude to climate change

Characteristics	Attitude Positive n (%)	Negative n (%)	χ^2	p-value
<i>Age group (years)</i>				
≤ 29	78 (34.4)	39 (19.9)	28.890	<0.001
30-39	103 (45.4)	71 (36.2)		
≥ 40	46 (20.3)	86 (43.9)		
<i>Sex</i>				
Male	120 (52.9)	52 (26.5)	30.228	<0.001
Female	107 (47.1)	144 (73.5)		
<i>Marital status</i>				
Currently married	122 (53.7)	142 (72.4)	15.686	<0.001
Not currently married	105 (46.3)	54 (27.6)		
<i>Ethnic groups</i>				
Yoruba	175 (77.1)	165 (84.2)	3.746**	0.290
Igbo	26 (11.5)	15 (7.7)		
Hausa	5 (2.2)	2 (1.0)		
Others*	21 (9.3)	14 (7.1)		
<i>Designation</i>				
House officers	62 (27.3)	20 (10.2)	23.213	<0.001
Medical officers	18 (7.9)	10 (5.1)		
Resident doctors	131 (57.7)	144 (73.5)		
Consultants	16 (7.0)	22 (11.2)		
<i>Completed years of practice</i>				
≤ 5	131 (57.7)	63 (32.1)	27.690	<0.001
≥ 6	96 (42.3)	133 (67.9)		

*Urhobo, Idoma, Isoko, Ishan, Ebira, Fulani, Ijaw, Ogori, Egun

**Likelihood ratio

presented in Table 12. Male respondents were two times more likely to have positive attitude towards climate change issues compared to their female counterparts [OR: 1.9; 95%CI: 1.2 – 3.1].

Respondents with good climate change knowledge were four times more likely to have positive attitude towards climate change issues [OR: 4.0; 95%CI: 2.6 – 6.3].

Table 11: Logistic regression model for predicting good knowledge of climate change among respondents

Characteristics	Odds ratio	95% Confidence Interval	p-value
<i>Sex</i>			
Male	2.122	1.351 – 3.334	0.001
Female	1		
<i>Age</i>			
≤35	1.717	0.963 – 3.064	0.064
≥36	1		
<i>Marital status</i>			
Currently married	1.125	0.633 – 1.998	0.688
Not currently married	1		
<i>Years of practice</i>			
≤5	1.014	0.554 – 1.859	0.963
≥6	1		

Variables not retained – ethnicity, designation

Table 12: Logistic regression model for predicting positive attitude towards climate change issues among respondents

Characteristics	Odds ratio	95% Confidence Interval	p-value
<i>Sex</i>			
Male	1.953	1.211 – 3.151	0.006
Female	1		
<i>Age</i>			
≤35	1.803	0.968 – 3.358	0.063
≥36	1		
<i>Marital status</i>			
Currently married	1.086	0.588 – 2.008	0.792
Not currently married	1		
<i>Years of practice</i>			
≤5	1.353	0.712 – 2.572	0.356
≥6	1		
<i>Total knowledge score</i>			
Good	4.032	2.597 – 6.250	<0.001
Poor	1		

Variables not retained – ethnicity, designation

Discussion

It has been documented that the perception of a problem may show the knowledge and the readiness to act towards preventing it [8]. The result of this study shows that majority of respondents were aware of climate change. This finding is similar to results of studies done in the United States of America and the United Kingdom which showed that the populations demonstrated a high level of awareness for global climate change [9, 10]. The high awareness about climate change among physicians in this study is anticipated as they are regarded as and looked up to as role models and well-informed people in the community [11-14]. Although awareness about climate change was high, knowledge of the various aspects of climate change (especially the health effects of climate change) was much lower. With such level of knowledge, it is doubtful if the physicians will be able to effectively discharge their expected social responsibility of climate change prevention and mitigation and to contribute meaningfully to policies meant to promote human health in the face of climate change realities [15-18].

In this study, the commonest source of information about climate change was the television followed by the radio, print media and the internet. Similar to this finding, Wilson [19], in a study carried out in the United States, showed that the mass media was the commonest source of scientific information especially climate change issues. This fact has been corroborated by other studies [17, 20]. However, Bell

[21], in a New Zealand study reported that over 80% of climate change stories were slightly inaccurate while one in six of the stories contained significant misreporting. Hence, Bell emphasized the need for scientists to work together with journalists to better inform the public about climate change. Also, about two-thirds of this study's respondents had good knowledge of adaptation to climate change. In a study on adaptation to climate change and sustainable development, Smit and Pilifosova[22], argued that the current knowledge of adaptation to climate change is insufficient.

Males were more knowledgeable about climate change in this study. However, Denton [23], reasoned that it is important to ensure that women who are more likely to suffer from the adverse effects of climate change understand the threats so as to ensure sustainable environmental development. This study also discovered that younger physicians in practice were more knowledgeable. In contrast, a Canadian qualitative study done among the general population reported that more of the older respondents were informed about climate change issues [24]. A possible explanation for this observed scenario is that these younger physicians study more, especially for their professional examinations and thus more likely to be in tune with contemporary public health issues. However, since doctors and scientists are often the source of information for journalists who in turn educate the population, it is imperative therefore that doctors as respected scientists update their knowledge on climate change [20, 25].

In this study, about half of the respondents had a positive or favourable attitude towards climate change and what their response should be. Physicians' attitude towards climate change is very important as it has been documented that physicians are well positioned to affect public attitude [5, 6]. Gill [26], was of the opinion that health professionals have not developed the attitude needed to make it easy to tackle climate change. As said by Gill and colleagues [16], doctors have a duty to inform their professional colleagues and the larger public, including policy makers, about the health costs of climate change. Gill et al [16] also opined that doctors, in addition to advocating on climate change issues, should also use their many networks to promote these issues.

Conclusion

This study revealed that awareness of climate change was high but in-depth knowledge of climate change and its health effects was only average among physicians at the University College Hospital, Ibadan. The mass media (television and radio) were the commonest sources of information on climate change. Respondents' attitude to climate change was fair as about half of them had positive attitude scores. This study showed younger age, male gender and being a resident doctor to be significantly associated with good knowledge about climate change and its health effect. In addition to the preceding factors, being currently married was also found to be significantly associated with positive attitude towards climate change issues.

Given the findings in this study, we recommend that climate change issues should be inculcated more into the continuing medical education of doctors and other health workers in order to improve their knowledge and attitude to prevention, mitigation and adaptation to climate change. This will go a long way to strengthen the capacity of the Nigerian health workers to manage the climate-change-related health effects and to participate in climate change policy discourse. Also, there is need for medical professionals to take more leadership roles in advocacy on climate change issues since they have a great influence on the public's knowledge and attitude to public health issues. Health workers should see this as an important social responsibility.

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