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Knowledge, Attitude, and Practice of Travel Medicine Among Healthcare Practitioners In Nigeria: a Cross-sectional Study

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Abstract

Introduction: Travel medicine in Nigeria is underdeveloped. The environmental, economic, and social conditions vary from country to country. This implies that healthcare practitioners must have vast knowledge of the field as misinformation can result in travel-related illness, psychological distress, and even death. Hence, this study assessed the knowledge, attitudes, and practices (KAP) of medical practitioners regarding travel medicine in Nigeria.

Methods: A cross-sectional survey was conducted among 296 medical practitioners across Nigeria using a semi-structured questionnaire. Statistical analyses were conducted using IBM SPSS v26.

Results: The study revealed that 50% of the respondents had good knowledge of travel medicine, with 85.5% showing positive attitudes. However, the proportion of medical doctors who demonstrated high-quality practice was low (7.1%). Key predictors of knowledge include attitude (B = 10.515, p < 0.0001) practice (B = 3.644, p < 0.0001), and geopolitical zone (-0.995, p = 0.038), while knowledge was a significant predictor of attitude (B = 0.013, p < 0.0001) and practice (B = 0.054, p < 0.0001). Also, medical doctors in the North-Western parts of Nigeria had a higher likelihood of demonstrating low knowledge (OR = 0.357, p = 0.034) and negative attitudes (OR = 0.235, p = 0.007) toward travel medicine compared to their counterparts from the South-West.

Conclusion: It is recommended that subsidized professional training programs be organized to ensure that medical practitioners are kept abreast of the best practices in the field. Future studies should explore specific barriers and evaluate the effectiveness of proposed interventions

Keywords: pre-travel consultations, immigration, Travel health risks, West-Africa, Healthcare.

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Introduction

Travel medicine is a field of medicine focused on all medical issues associated with both local and international travel [1]. This field of study encompasses the prevention, diagnosis, and management of various ailments [2]. Some of these ailments include infectious diseases like malaria, traveller's diarrhoea, and yellow fever as well as non-infectious ailments like trauma, embolisms, jet lag, and sunburn [2]. Travel medicine is globally relevant because it seeks to reduce the significant of morbidities and mortality associated with travel by providing pre- and post-travel consultations [3].

Travel medicine practitioners are medical personnel focused on providing pre- and post-travel consultations. They offer guidance on managing any medical conditions

associated with travel and monitor and manage infectious disease outbreaks, such as Ebola or COVID-19, by working closely with public health authorities and other healthcare professionals [4-7]. Effective travel medicine is essential for preventing and detecting disease outbreaks [8]. It offers pre-travel consultations and advice to ensure travellers are informed about routine vaccinations and safety measures to prevent disease transmission [9,10]. Also, by prescribing prophylactic malaria treatment to those traveling to endemic areas, travel medicine contributes to malaria prevention [11]. This is particularly important as malaria remains a significant public health issue, especially in sub-Saharan Africa, where malaria incidence and mortality among tourists are well-documented [11-14].

The importance of travel medicine has increased significantly following the global rise in international immigration and the outbreak of the Ebola virus and Coronavirus [4,7]. Although the statistics on Nigerian immigrants are not duly captured in the literature, studies suggest that a significant number of Nigerians are emigrating to more developed countries due to poor remuneration, unemployment, and insecurity [15,16]. Unfortunately, despite the significant rise in the emigration of citizens out of Nigeria, travel medicine is characterized by inadequate pre- and post-travel consultations, thus increasing the risk of travel-related diseases and mortality in Nigeria[17,18].

Inadequate knowledge and poor attitude and practices regarding travel medicine among medical professionals can lead to inappropriate or inadequate care for travellers, resulting in negative health outcomes. Hence, the aim of this study is to examine the current state of travel medicine in Nigeria by assessing the knowledge, attitude, and practices of medical doctors towards travel medicine. The specific objectives of the study are to assess the knowledge, attitudes, and practices of medical practitioners in Nigeria towards travel medicine; identify the significant correlates of knowledge, attitudes, and practices of medical practitioners; and identify the significant predictors of knowledge, attitudes, and practices of medical practitioners towards travel medicine in Nigeria.

1.Methodology

1.1. Study design

This study was designed as a cross-sectional study. Using a well-structured questionnaire, data to assess knowledge, attitude, and practice of travel medicine were collected from doctors actively practicing medicine in Nigeria. A schematic representation of the research methodology is shown in Figure 1.

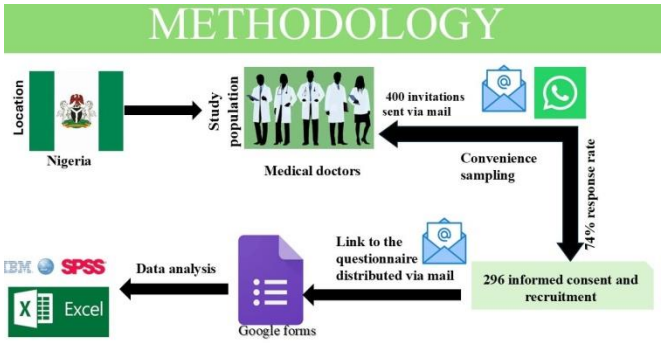

Figure 1. Schematic representation of research methodology

1.2. Location

This study was conducted in Nigeria, Africa. Nigeria has 36 states and one federal capital territory (FCT) which is grouped into 6 geopolitical zones. These are the North Central which is made up of Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau states and the FCT. The Northeastern region comprises Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe states. The Northwestern region is made up of Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara states. The South-Eastern region comprises Abia, Anambra, Ebonyi, Enugu, and Imo states. The South-South region comprises Akwa Ibom, Bayelsa, and Cross River states. Lastly, the South-Western region is made up of Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states.

1.3. Study population

This study is a pilot study focused on assessing the knowledge, attitudes, and practices of medical doctors towards travel medicine in Nigeria regardless of whether they practiced travel medicine directly or indirectly. Although, including other healthcare professionals like nurses, pharmacists, therapists, and psychologists would have provided a more comprehensive view of the current state of travel medicine in the Nigerian healthcare system. Focusing solely on medical doctors – frontliners in pre- and post-travel consultations, this study provides specific and in-depth insight into travel medicine within this group of healthcare workers.

1.3.1. participant recruitment

The participants were identified through the Medical and Dental Council of Nigeria (MDCN) to ensure that all participants were licensed medical doctors actively practicing medicine in Nigeria. Recruitment links were disseminated to members of MDCN through emails and the official MDCN WhatsApp platforms between February 2024 to September 2024. A total of 400 medical doctors were contacted via email. 296 medical doctors who gave informed consent were recruited and sent an additional link to fill out the questionnaire (74% response rate). Participant recruitment and administration of the research instrument occurred concurrently.

1.3.2. Sample Size and Sampling Technique

The sample size was estimated using the Raosoft sample size calculator (Sample Size Calculator by Raosoft, Inc.). There is no available information on the total number of Nigerian doctors who are members of MDCN, as such the population was assumed to be 20,000. The error margin of 5% and the confidence level of 95%. The sample size was estimated to be 377 which was approximated to 380 participants. A convenience sampling technique was employed since the researchers have no physical contact with the study participants and a list of the members of MDCN is not made available to the public.

1.4. Research instrument

The data was collected using an online semi-structured questionnaire developed based on existing literature and validated scales. The research instrument was pretested in a pilot study comprising 50 participants who were all medical doctors. However, individuals who participated in the pilot study were excluded from the main study. The research instrument was then modified where necessary before administration to the main study participants. The research questionnaire was designed to collect information on the social demography of the participants, their medical profession, knowledge, attitude, and practices towards travel medicine.

1.4.1. Socio-demography

The independent variables in these studies are the socio-demography of the participants such as age, gender, religion, academic qualifications, cadre, geo-political zone, years of practicing medicine and travel medicine, and whether the participants are direct or indirect practitioners of travel medicine. These variables served as the independent variables. Age was measured continuously while the other variables were measured categorically.

1.4.2. Knowledge

Knowledge served as a dependent variable for all variables captured under socio-demography. However, knowledge was used as an independent variable while identifying the significant predictors of practice and attitude. The questions used to access the knowledge of the medical practitioners on travel medicine were designed based on the key dimensions of travel medicine practice described by Kogelman, et al. [19], Kurup, et al. [6] and Kumar, et al. [5]. The knowledge scale contained 24 questions that evaluated the respondents' general knowledge of travel medicine, travel insurance, motion sickness, chemoprophylaxis, weather protection, in-flight exercise, sexually transmitted infections, and the special conditions associated with traveling while pregnant or traveling while having physical disabilities. The questions were graded over 100, scores below 50 were classified as low knowledge while scores between 51 – 69 and scores from 70 and above were classified as good knowledge and average knowledge respectively.

1.4.3. Attitude

Attitude served as a dependent variable for all variables captured under socio-demography. However, while identifying the significant predictors of practice and knowledge, attitude was used as an independent variable. The 5 items used to assess the attitude of the respondents toward travel medicine were extracted from the questionnaire designed by Kumar, et al. [5]. The scale used a Likert scale of 5, strongly disagree (0), disagree (1), neither agree nor disagree (2), agree (3), and strongly agree (4). The mean scores were classified as negative (0–1.99), neutral (2.00 – 2.99), and positive (3.0 – 4.0)

1.4.4. Practice

The practice served as a dependent variable for all variables captured under socio-demography. However, while identifying the significant predictors of knowledge and attitude, practice was used as an independent variable. The quality of travel medicine practice displayed by the medical practitioners was measured on a Likert scale of 4 using a 9-item scale designed by Kumar, et al. [5]. The items measured the frequency at which the respondents engaged in certain travel medicine consultation activities. The Likert scale used was never (1), rarely (2), sometimes (3) and often (4). The mean scores were classified as low (1 – 1.99), average (2.0 – 2.99), and high (3.0 – 4.0)

1.5. Data Analysis

All the data presented in this study were analysed using IBM SPSS 26, and the results were presented in charts and tables. Descriptive statistics was used to observe the trends in the data while chi-square, linear regression, and logistic regression were used to explore the interrelationship between knowledge, attitude, and practice, and their relationship with the socio-demography of the respondents

1.6. Ethical Considerations

Ethical approval was obtained from the Oyo State Ethical Review Board before the commencement of the study. Informed consent was also obtained from all participants before the administration of the research instrument.

2. Results

The findings presented in this study were collected from two hundred and ninety-six medical doctors directly or indirectly practicing travel medicine in Nigeria. The study population had a higher proportion of males (51.7) than females with a mean age of 42.06 ± 7.77 years. Slightly more than half of the medical practitioners were from the Southwestern parts of Nigeria. Majority of the respondents were medical officers (30.1), resident doctors (31.8) and consultants (30.7). The findings from the study also revealed that 89.9% of the study participants have been in the medical profession for more than 4 years. Regarding the practice of travel medicine, only a small proportion (30.1%) of the study participants identified as travel medicine practitioners with only 5.6% of the acclaimed practitioners of travel medicine having formal certification. Half of the respondents also reported that they have been practicing travel medicine for less than 5 years (Table 1).

Table 1. Socio-demography of study participants

Demography (n = 296)		Frequency (%)
Gender	Male	153 (51.7)
	Female	143 (48.3)
Age	< 30 years	14 (4.7)
	30 – 49 years	234 (79.1)
	50 years and above	48 (0.3)
Religion	Christianity	231 (78.0)
	Islam	63 (21.30
	Others	2 (0.7)
Geopolitical zone	South-West	152 (51.4)
	South-South	40 (13.5)
	South-East	24 (8.1)
	North-central	35 (11.8)
	North-East	17 (5.7)
	North-West	28 (9.5)
Highest qualification	MBBS	111 (37.5)
	Master's degree	97 (32.8)
	Member	11 (3.7)
	Fellows	72 (24.3)
	Professors	5 (1.7)
Cadre	House officer	22 (7.4)
	Medical officer	89 (30.1)
	Resident doctor	94 (31.8)
	Consultant/Specialist	91 (30.7)
Years of practicing medicine	< 5 years	30 (10.1)
	5 – 10 years	100 (33.8)
	11 – 15 years	26 (8.8)
	16 – 20 years	94 (31.8)
	More than 20 years	46 (15.5)
Travel medicine practitioner	Yes	69.9
	No	30.1
Years of practicing travel medicine	< 5 years	50.6
	5 – 14 years	33.7
	15 – 20 years	12.4
	More than 20 years	3.4
Formal travel medicine certification	Yes	5.6
	No	94.4

2.1. Knowledge, attitudes, and practice of medical practitioners regarding travel medicine

The data presented in Figure 2 indicates that half of the medical practitioners (50.0%) recruited for this study had good knowledge of key dimensions associated with travel medicine. A preponderance (65.5%) of the medical practitioners had a good knowledge of the necessary preparation and health assessments that should be conducted before travel. Half of the study participants (50.7%) had a good knowledge of the special conditions associated with travel such as traveling at a certain gestational period while 42.2% had a good knowledge of the health risks associated with travel. A large proportion of the study participants showed positive attitudes toward travel medicine while a small proportion (7.1) had responses that were indicative of high practice quality.

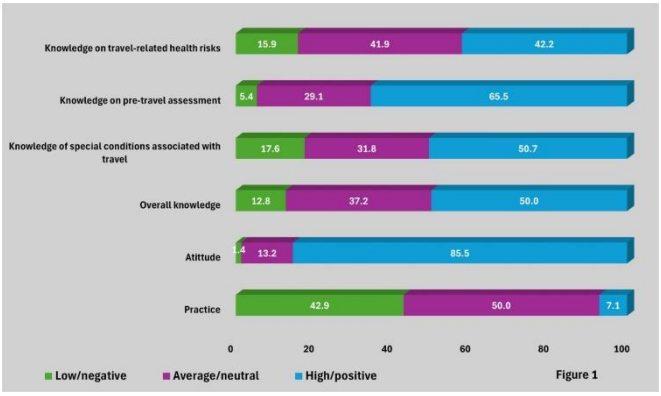

Figure 2. The level of knowledge, attitude, and practice shown by medical practitioners regarding travel medicine in Nigeria

The chi-square analysis presented in Table 2, revealed that knowledge varied significantly based on religion and the attitude and practice levels of the study participants. The majority of the practitioners with positive attitudes (54.5%) and average practice quality (64.9%) towards travel medicine had a good knowledge of the key dimensions in the field. A higher proportion of medical practitioners from the North-Western parts of Nigeria (39.3%, p = 0.010) showed a neutral attitude

towards travel medicine compared to their counterparts from other zones (Table 2). Also, a higher proportion of practitioners with average (82.7%) and good (93.2%) knowledge showed positive attitudes towards travel medicine compared to those with poor knowledge (63.7%, p = 0.0001). The quality of practice displayed by the medical practitioners from the North-central part of Nigeria was significantly higher (p = 0.004) than that of their counterparts from other regions. Practitioners with good knowledge also showed displayed better practice quality than their counterparts (p < 0.0001).

Table 2. Distribution of knowledge, attitude, and practice based on the socio-demographic characteristics of study participant

Demography	Knowledge				Attitude				Practice			
	Low (%)	Moderate (%)	High (%)	p-value	Low (%)	Moderate (%)	High (%)	p-value	Low (%)	Moderate (%)	High (%)	p-value
Religion				0.048				0.555				0.197
Christian	10.0	38.5	51.5		1.3	12.1	85.6		45.9	46.3	7.8	
Muslims	22.2	33.3	44.4		1.6	15.9	82.5		31.7	63.5	4.8	
Others	50.0	0.0	50.0		0.0	50.0	50.0		50.0	50.0	0.0	
Geo-political zone				0.134				0.010				0.004
South-West	9.2	38.2	52.6		1.3	9.9	88.8		48.0	48.0	3.9	
South-South	15.0	37.5	47.5		2.5	10.0	87.5		40.0	55.0	5.0	
South-East	8.3	33.3	58.3		0.0	12.5	87.5		45.8	45.8	8.3	
North-central	11.4	31.4	57.1		0.0	14.3	85.7		37.1	40.0	22.9	
North-East	17.6	47.1	35.3		5.9	5.9	88.2		52.9	47.1	0.0	
North-West	32.1	35.7	32.1		0.0	39.3	60.7		17.9	71.4	10.7	
Above 20 years	6.5	34.8	58.7		2.2	15.2	82.6		39.1	56.5	4.3	
Knowledge								0.0001				0.0001
Low					0.0	36.8	63.2		50.0	50.0	0.0	
Average					2.7	14.5	82.7		61.8	30.0	8.2	
Good					0.7	6.1	93.2		27.0	64.9	8.1	
Attitude				0.0001								0.122
Negative	0.0	75.0	25.0						50.0	25.0	25.0	
Neutral	35.9	41.0	23.1						51.3	35.9	12.8	
Positive	9.5	36.0	54.5						41.5	52.6	5.9	
Practice				0.0001				0.122				
Low	15.0	53.5	31.5		1.6	15.7	82.7					
Average	12.8	22.3	64.9		0.7	9.5	89.9					
High	0.0	42.9	57.1		4.8	23.8	71.4					

2.2. Significant correlates of knowledge, attitude and practices

The significant positive correlates of knowledge are practice (r = 0.238, p < 0.0001), attitude (r = 0.400, p < 0.0001), and years of practicing medicine (r = 0.122, p = 0.036). This implies that increases in practice and attitude are associated with significant increases in knowledge. As shown in Table 3, geopolitical zone is a negative correlate of knowledge which suggests that medical practitioners from certain regions in Nigeria have lower knowledge of the key dimensions of travel medicine (r = -0.135, p = 0.015). It is worth noting that directly practicing travel medicine, having higher academic qualifications, and the duration of practicing travel medicine had no significant relationship with the level of knowledge displayed by the medical practitioners.

Practice (r = 0.123, p = 0.034) and knowledge (r = 0.400, p = 0.0001) are significant positive correlates of attitude which indicates that there is a significant association between the attitude of medical practitioners towards travel medicine, and the quality of practice and the level of knowledge displayed by the practitioners. Geo-political zone had a negative correlation with attitude suggesting that medical practitioners from certain regions have a more negative attitude towards travel medicine. Attitude (r = 0.123, p = 0.034) and knowledge (r = 0.238, p = 0.0001) were the only significant correlates of the quality of practice shown by the study participants. This suggests the higher practice quality in associated with good knowledge and positive attitude towards travel medicine.

Table 3: Multiple regression analysis identifying the significant predictor of knowledge, attitude, and practice.

Model summary					coefficients			
Models	**R**	**Adjusted R2**	**F**	**Sig**	**B**	**β**	**t**	**Sig.**
Model 1 (predictors of knowledge)								
	0.465	0.206	20.06	0.0001				
Attitude					10.515	0.356	6.715	**0.0001**
Practice					3.644	0.202	3.823	**0.0001**
Geo-political zone					-0.995	-0.110	-2.083	**0.038**
Years of practicing medicine					1.008	0.084	1.607	0.109
Model 2 (predictors of attitude)								
	0.410	0.168	19.69	0.0001				
Practice					0.026	0.043	0.770	0.442
Geo-political zone					-0.026	-0.087	-1.590	0.113
Knowledge					0.013	0.378	6.773	**0.0001**
Model 3 (predictor of practice)								
	0.240	0.051	8.93	0.0001				
Knowledge					0.012	0.224	3.625	**0.0001**
Attitude					0.054	0.033	0.537	0.592

2.3. Significant predictor of knowledge, attitude, and practice regarding travel medicine in Nigeria

The variables identified as significant correlates of knowledge, attitude, and practice were used to identify the significant predictors of these variables using multiple regression and logistics regression analysis.

2.3.1. Significant predictor of knowledge

The findings presented in Table 3, show that 20.6% of the variations in the knowledge of Nigerian medical practitioners regarding travel medicine can be accounted for by attitude, practice, geo-political zone, and years of practicing medicine ($p < 0.0001$). Attitude is a strong positive predictor of knowledge ($p < 0.0001$) of knowledge. As indicated by the B coefficient a unit increase in positive attitude would cause a 10.55-unit increase in knowledge. Logistics regression also identified attitude as a positive and significant indicator of knowledge ($p < 0.0001$). As shown in Table 4, medical practitioners with negative attitudes had a higher likelihood of having low knowledge regarding travel medicine (OR= p = 0.02). This implies that medical practitioners with positive attitudes towards travel medicine tend to have high knowledge on travel medicine.

Practice is another significant predictor of knowledge ($p < 0.0001$). A unit increase in the quality of practice displayed by the medical practitioners influences knowledge by 3.64 units. Practice positively impacts knowledge (OR = 2.981, $p = 0.0001$). As shown in Table 4, medical practitioners with low and average practice quality had a higher likelihood of having low knowledge regarding travel medicine compared to those who showed high-quality practice.

The last significant predictor of knowledge identified in this study is geo-political zone ($p = 0.038$). As observed from the study, medical doctors from the North-West have a higher likelihood of displaying low knowledge on travel medicine compared to their colleagues from the South-Western part of Nigeria ($p = 0.034$).

Table 4. Logistic regression analysis identifying the significant predictor of knowledge, attitude and practice.

Indicators	B	Wald	Exp (B)	Sig.	95% CI
Knowledge					
Geopolitical zone	-0.149	3.906	0.862	**0.048**	0.744 – 0.999
South-West		7.487	1	0.187	
South-South	-0.417	1.116	0.659	0.291	0.304 – 1.428
South-East	0.189	0.147	1.208	0.701	0.460 – 3.171
North-central	0.152	0.126	1.164	0.723	0.502 – 2.700
North-East	-0.777	1.709	0.460	0.191	0.143 – 1.474
North-West	-1.030	4.479	0.357	**0.034**	0.138 – 0.927
Attitude	1.221	10.836	3.391	**0.001**	1.639 – 7.016
Negative		7.848	1	**0.020**	
Neutral	0.168	0.016	1.182	0.889	0.089 – 15.640
Positive	1.315	0.256	3.724	0.297	0.314 – 44.168
Practice	1.092	24.908	2.981	**0.0001**	1.941 – 4.578
Low		31.091	1	**0.0001**	
Average	-1.248	5.352	0.296	**0.021**	0.100- 0.826
High	0.286	0.284	1.332	0.594	0.465 – 3.816
Attitude					
Geopolitical zone	-0.189	4.021	0.827	**0.045**	0.688 – 0.996
South-West		8.260		0.143	
South-South	-0.038	0.004	0.963	0.947	0.219 – 3.385
South-East	-0.150	0.046	0.861	0.830	0.292 – 3.017
North-central	-0.063	0.11	0.939	0.916	0.230 – 5.953
North-East	0.157	0.036	1.170	0.850	0.082 – 0.674
North-West	-1.450	7.254	0.235	**0.007**	0.082 – 0.674
Knowledge	0.989	16.497	2.689	**0.0001**	1.669 – 4.335
Low knowledge		14.501		**0.001**	
Average knowledge	1.110	5.935	3.033	**0.015**	1.242 – 7.406
Good knowledge	1.926	14.399	6.859	**0.0001**	2.537 – 18.546
Practice					
Attitude	-1.091	6.055	0.336	**0.014**	0.141 – 0.801
Negative attitude		6.334		**0.042**	
Neutral attitude	1.261	0.61	0.732	0.805	0.062 – 8.664
Positive attitude	1.200	1.858	0.195	0.173	0.19 – 2.047

2.3.2. Significant predictor of attitude

The linear regression presented in Table 3 identified knowledge as a significant predictor of attitude (0.0001). The logistic regression coefficients also identified knowledge as a significant and positive indicator of attitude ($p < 0.0001$). It was also observed that medical practitioners who showed average and good knowledge of travel medicine had significantly higher odds of having a positive attitude than those with low knowledge. As shown in Table 4, the geo-political zone is also a significant indicator of attitude. Medical practitioners in the North-Western part of Nigeria also had a lower likelihood of having a good attitude towards travel medicine compared to those from the South-Western parts.

2.3.3. Significant predictor of practice

The linear regression analysis conducted revealed that knowledge had a significant relationship with practice ($p < 0.0001$). However, from the logistics regression analysis, the odds of low practice quality are higher amongst medical practitioners with negative attitudes towards travel medicine compared to their counterparts ($p = 0.014$).

3. Discussion

This study comprised 296 medical doctors from different regions of Nigeria, with 30.1% of the participants identifying as travel medicine practitioners. However, only 5.6% of the acclaimed practitioners of travel medicine had formal certification. The preponderance of the study participants showed good knowledge and positive attitudes toward travel medicine, but only a small fraction of the participants demonstrated high-quality practice. Practice, knowledge, and geo-political zones were significant predictors of knowledge. The study also revealed that medical doctors in the North-West had a low likelihood of demonstrating good knowledge and positive attitudes compared to their counterparts from the South-West. It is however, worth noting that the knowledge, attitude, and practices of medical doctors in Nigeria regarding travel medicine could have been over- or under-estimated due to the small sample size and bias associated with self-reporting. While this affects the generalisability of the research findings, this study provides valuable insights into the state of travel medicine in Nigeria and could guide the implementation of policy reforms to develop the field of travel medicine.

The findings from this research indicate a low uptake of travel medicine by medical practitioners in Nigeria. This supports the findings from related literature which suggests that travel medicine in Nigeria is still in the infancy [17,18,20]. This explains the findings from the study conducted by Jegede, et al. [18] and Michael, et al. [21] which revealed that most Nigerians who are international travelers often get their pre-travel advice from relatives and social media rather than from medical practitioners. These findings suggest that the observed trends of Nigerian international travelers seeking health-related pre-trave advice from relatives and social media is likely due inadequate number of travel medicine practitioners in Nigeria.

The findings from the study showed that a preponderance of the practitioners gave pre-treatment advice less often which suggests that travel medicine in Nigeria is still at its developmental stage. This is similar to the study conducted by Kurup, et al. [6] which revealed that travel medicine practitioners, though knowledgeable about travel medicine had less frequent pre-travel visits from travellers due to a lack of awareness regarding the risks associated with travel.

According to Olutuase, et al. [22], despite having good knowledge and a positive attitude towards travel medicine, effective practice can be hindered by systemic barriers. The review conducted by Olutuase, et al. [22], showed that medical practice in Nigeria is hindered by poor infrastructure, financial constraints, inadequate training of healthcare professionals and lack of patient adherence to healthcare plans, national insecurities, weak policies for improved healthcare delivery and inadequate number of trained healthcare professionals. These challenges could explain while The proportion of practitioners who displayed high-quality practice was remarkably low despite the good knowledge and positive attitude demonstrated by the study participants.

The findings from the study also revealed that knowledge is influenced by attitude and practice and, that practice and attitude are influenced by knowledge. This supports existing literature which suggests that a strong knowledge base on a subject matter fosters a positive attitude which stimulates a patient-centered approach and motivates medical practitioners to deliver high-quality care [20,23,24]. High-quality medical practice ensures that one remains abreast with the latest guidelines in their field, thereby enhancing knowledge and expertise [25].

The results also revealed that medical practitioners in the Southwest had better knowledge and attitudes towards travel practice than those from North-Western Nigeria. This could be due to the higher adoption of Western education in the South-West compared to the North-West as observed from literature [26-30]. Also, Lagos state which is in the South-Western part of Nigeria is the most industrialized and population state in the country, housing one of the most popular international airports in Nigeria[31].

This suggests that doctors practicing medicine in the South-West are more likely to encounter international travellers than doctors in the North-West.

One of the major limitations of cross-sectional study design is the inability to establish causality. This study provided valuable insight into the knowledge, attitude, and practice of Nigerian doctors toward travel medicine by examining the association between these variables. However, due to the cross-sectional design, it was impossible to determine the cause-and-effect relationship between these variables. Also, the use of self-reported questionnaires might have resulted in bias as study participants might not accurately recall past behaviours or occurrences. This could result in an over- or -under estimation of the actual knowledge, attitude and practices of the participants.

4. Conclusion

This study provides valuable insight into the knowledge, attitude, and practices of medical doctors regarding travel medicine in Nigeria. The study revealed that the uptake and practice of travel medicine in Nigeria is low despite the good knowledge and positive attitudes demonstrated by the medical doctors. These disparities highlight the presence of systemic barriers to the effective implementation of travel medicine in Nigeria. It is therefore recommended that regular professional training programs be organized to ensure that medical practitioners are kept abreast with the best practices in the field. Also, this training should be subsidized to relieve healthcare professionals of the financial burdens associated with participating in such programs. Programs and policies that foster inter-regional collaborations should also be implemented to reduce regional disparities in the quality of travel medicine practices in Nigeria. Public awareness campaigns should be conducted to encourage travellers to engage in pre- and post-travel consultations, thereby mitigating the health risks associated with travel.

Finally, the findings from this study highlight the need for further research to explore specific barriers and evaluate the effectiveness of proposed interventions. This is crucial for understanding the systemic challenges that hinder the effective practice of travel medicine in Nigeria and for developing targeted strategies to overcome these obstacles.

Highlights

What Is Already Known?
The paucity of travel medicine practitioners in Nigeria could be a contributory factor to the incidence or Prevalence or travel related illnesses.

What Does This Study Add?
The challenges faced by Nigerian Travel Medicine Practitioners could reduce with the increase in their certification. This would directly increase their knowledge which will then promote a better attitude and subsequently an improvement in the practice of travel medicine in Nigeria.

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Data availability
The data underlying this article are available in the article.

Authors contributions
Olatunde O: conceptualization, data curation, funding acquisition, project administration, resources, validation, visualization, writing review and editing; Iliodiba N: conceptualization, formal Analysis, validation, visualization, writing original, writing review and editing; Alao A: formal Analysis, validation, visualization, writing review and editing; Alawode O: visualization, writing review and editing; Kajero A: data curation, writing review and editing; Bakare O: data curation, writing review and editing; Oliyide O: data curation, writing review and editing; Ibisola B.A: conceptualization, writing review and editing; Ayoola B: data curation, writing review and editing.

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Conflict of interest
Authors declare no conflict of interests

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