

NUTRITION-RELATED KNOWLEDGE AND ATTITUDE OF PRACTISING NIGERIAN MEDICAL DOCTORS TO NUTRITION COUNSELLING DURING THE COVID-19 PANDEMIC 2020

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ABSTRACT

Background: Adequate nutrition is needed to enhance the immune system, especially at the time of COVID-19 pandemic for disease prevention and treatment.

Objective: The study aimed to assess physicians' knowledge to nutrition-related issues of COVID-19 infection and explore their attitudes to offering nutritional counselling to patients.

Method: This was a cross-sectional online study conducted among doctors in private and public institutions across the six (6) geo-political zones in Nigeria using the social media online platforms of the Nigerian Medical Association (NMA) from August 17 to September 26, 2020. A categorisation of the knowledge score into sufficient and insufficient was done using the mean (sd) knowledge score. The attitude score was categorised into positive and negative using the median (IQR) attitude score, and bivariate analysis was used to test for associations.

Results: Responses were gotten from a total of 176 doctors over six weeks of data collection. Majority 97 (55.1%) were females, and 84 (47.7%) had practised between 11 and 20 years. Majority 95 (54.0%) had insufficient knowledge, while 128 (72.7%) of the respondents had a negative attitude to nutrition counselling of patients regarding COVID-19. Females had significantly better knowledge about nutrition-related issues of COVID-19 ($p=0.004$). However, there was no significant difference in the respondents' attitude based on professional cadre, gender, place of practice, and years of practice.

Conclusion: Respondents were deficient in the knowledge of common food items containing relevant nutrients essential for boosting immunity. Hence, there is a need to encourage physicians training in nutrition and nutritional counselling.

Keywords: COVID-19, Nutrition-knowledge, Attitude, Physicians, Nigeria

INTRODUCTION

The novel disease caused by a new strain of Coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) popularly called COVID-19 was firstly discovered in Wuhan city, Hubei Province of China in December 2019.¹ Everyone is susceptible to the zoonotic infection; however, the body's immune system is crucial in fighting the virus in the body. Hence, the elderly population and people living with some diseases that render them immunocompromised are more at risk with associated greater mortality than the younger healthy population. 2 Clinical studies have shown that a healthy person's immune system could fight the virus within days.² It was observed that there was a complete immune response across all cell types necessary for building the immune system to recover an infected patient.³ From a

nutritional standpoint, some foods can be eaten at the time of this virus outbreak that can help strengthen the immune system.⁴ Given the side effects of COVID-19 on the nutritional status of patients, it is not surprising that nutrition agencies around the world have published guidelines, consensus, opinions, guidelines and specific recommendations for COVID-19.⁵

Many patients with acute infection have inadequate nutrition and water-electrolyte imbalance because of the consequential loss of appetite, vomiting and diarrhoea. Therefore, the provision of adequate nutrition and proper rehydration is an essential part of care and prevention.⁶ Despite various international interventions, the management of COVID-19 remains supportive, strengthening the need for proper

nutritional counselling.⁷ Hence, as we combat with COVID-19, it is crucial to make sure that the population's dietary requirements are met and upheld, especially the most vulnerable group.⁸ Adequate nutrition can be vital in preventing an over-inflammatory response to SARS-Cov-2 infection, preventing the disease from progressing to severe illness. The same approach is crucial in improving outcomes even during COVID-19.⁹ Several nutrients have been reported to be important in preventing and treating COVID-19.¹⁰ These include vitamins A, D, C and E, minerals such as zinc and selenium, fibre and essential fatty acids. This is because it stimulates action on the immune system. Thus, Improper diet and poor health can reduce resistance to infection and increase the severity of illness.¹¹

The World Health Organization (WHO) has emphasised the benefit of adequate nutrition to enhance the immune system, especially at the time of COVID-19 infection.¹² The European Society for Clinical Nutrition and Metabolism (ESPEN) gave concise guidance for the effective nutritional management of COVID-19 patients with ten statements aimed at the prevention and treatment of malnutrition in these patients.¹³

The ESPEN 2019 guidance consensus is for nutrition specialists to communicate the guidance to other health professionals to improve nutrition knowledge and overall care during COVID-19 era. Knowledge can have a significant impact on the perception of healthcare providers based on the experiences they have. It could delay optimising the nutrition of potential COVID-19 patients during a pandemic.¹⁴ However, the level of nutrition-related knowledge and attitudes of healthcare providers about COVID-19 is still not clear. Therefore, this study aimed to investigate the knowledge of doctors on nutrition-related issues of COVID-19 pandemic based on WHO recommendations and the ESPEN guidance 2019. We explored the attitude of doctors to offering nutritional counselling to patients seen during the COVID-19 pandemic using the health belief model.^{15, 16}

METHODOLOGY

Study Design

This was a cross-sectional study via online social media platforms through google form links sent via emails and WhatsApp. The form was filled at the convenience of the doctors recruited from their laptops and phones.

Study Setting and population

The study was conducted across the six (6) geo-political zones in Nigeria using the social media online platforms of the Nigerian Medical Association (NMA). All

consenting doctors in private and public institutions from each of the six geo-political areas in Nigeria were recruited using the social media online platforms of the NMA from August 17 to September 26, 2020. Our respondents span from all specialities.

Sampling

The minimum sample size was calculated using the Leslie Kish¹⁷ formula for single proportion descriptive studies.

$$n = \frac{Z^2 pq}{d^2}$$

Where n=sample size

z=the standard normal deviate, usually set at 1.96, which corresponds to the 95% confidence level.

p= percentage of Nigerian doctors to be interviewed 50% (NMA 2020).

q= 1.0- p = 1.0- 0.5 = 0.5

d= degree of accuracy desired, usually set at 5% =0.05

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$n = 384.$$

A purposive sampling technique method was employed to select eligible doctors to participate. The minimum members calculated were recruited across the six geo-political zones of Nigeria from NMA social media platforms. Only a total of 176 doctors completed the online survey over six weeks.

Inclusion and exclusion criteria: The study included male and female doctors practising in the identified representative States of Nigeria, registered on the State's NMA social media site who were willing to participate in the study. However, excluded Physicians, not on any social media network of NMA and those unable to access the NMA media site during the study period.

Data collection

A Self-administered online survey was administered to consenting doctors with information on the following sections:

Section A: Socio-demographics (age, gender, years of practice, speciality, location of practice, type of practice, prior nutrition education training).

Section B: Nutrition-related COVID-19 knowledge. Questions were generated based on WHO guidelines and ESPEN guidelines on nutrition recommendations to the general public and at-risk patients during COVID-19 pandemic.¹³ True (T), False (F) and Not Sure (NS) was employed. Every correct option was scored 1, and incorrect or not sure responses were scored 0. Mean (SD) knowledge scores were to be generated because the data were not normally distributed. The Kolmogorov-Smirnov Test for

normality distribution, $p = 0.000$. Respondents that had mean (sd) and above were categorised as having sufficient knowledge. Respondents with scores below mean (sd) were categorised as having insufficient knowledge.¹⁸

Section C: Attitude to the provision of nutrition counselling to patients during COVID-19 pandemic. The health belief model principles were used to generate 16 attitude questions assessed using a 5-point Likert scale. 5-point Likert scale options used included: (Strongly disagree, disagree, neutral, agree, and strongly agree). These were converted to scores; all the disagree were merged and scored as 0, all the agree were merged and scored as 1, Neutral was scored as 0. The overall attitude score was not normally distributed, test for normality and Kolmogorov-Smirnov Test for normality distribution, $p = 0.003$, so is reported as the median (IQR). Respondents that had a median (IQR) and above were categorised as having a positive attitude. Respondents with scores below the median (IQR) were categorised as having a negative attitude.¹⁸

Data analysis

The data generated was entered into the system and then analysed using the Statistical Package for the Social Sciences (SPSS) version 21.¹⁹ Frequencies were generated for the socio-demographic characteristics and categorisation of the knowledge score into sufficient and insufficient was done using the mean (sd) knowledge score. A mean score of >21 was taken as sufficient knowledge, while a mean score of <21 was taken as insufficient. The categorisation of the attitude score into positive and negative was done using the median (IQR) attitude score. A score of > 10 was taken as positive attitude, while a score of <10 was taken as a negative attitude. Bivariate analysis was used to test associations between socio-demographic characteristics and knowledge and attitude categories. The level of significance was set at $p=0.05$.

Ethical consideration

The study was approved by the University of Ibadan/ University College Hospital (UI/UCH), ethical review board (ethical approval number: UI/EC/20/0322). Informed consent was sought by proxy from respondents by an introductory message to the survey and the need to accept to proceed with the online survey.

RESULTS

Socio-demography profile of respondents

Responses were gotten from a total of 176 doctors, given a response rate of 45.8%. Many 97(55.1%) of the respondents were females, while 79(44.9%) are males. Eighty-four (47.7%) had practised between 11

Table 1: Socio-Demographic Characteristics of the Participants

Characteristics	n(%)
Gender	
Male	79 (44.9)
Female	97 (55.1)
Years of Practice (years)	
1-10	64 (36.4)
11-20	84 (47.7)
21-30	14 (8.0)
31-40	10 (5.7)
41-50	4 (2.3)
Type of Practice	
Private	28 (15.9)
State Government	53 (30.1)
Teaching Hospital	80 (45.5)
Federal Medical Centre	12 (6.8)
N.G.O.s	3 (1.7)
Cadre	
House Officer	6 (3.4)
Medical Officer	13 (7.4)
Senior/Principal/Chief Medical Officer	17 (9.7)
Registrar	31 (17.6)
Senior Registrar	39 (22.2)
Consultant	70 (39.8)
Medical College Attended	
North Central	21(11.9)
North East	5 (2.8)
North West	23 (13.1)
South East	10 (5.7)
South-South	17 (9.7)
South West	92 (52.3)
Others	8 (4.5)

and 20 years, followed by 64 (36.4%) with years of practice ranging from 1-10. Eight per cent, 5.7% and 2.3 % had practised for between 21 to 30 years, 31 to 40 years and 41 to 50 years respectively. Majority, 80(45.5%) of the respondents practised in Teaching Hospitals, 53(30.1%) practice in State Government Hospitals, 28(15.9%) practice in Private Hospitals, 12(6.8%) at Federal Medical Centres while 3(1.7%) practice in NGOs.

Majority, 70(39.8%) of respondents are Consultants, 39(22.2%) are Senior Registrars, 31 (17.6%) are Registrars, 17(9.7%) are Senior/Principal/Chief Medical Officers, 13(7.4%) are Medical Officers, and 6(3.4%) of the respondents are House Officers. A significant proportion 92 (52.3%) of the respondents got trained in medical schools in the South West, 23 (13.1%) in North West, 21(11.9%) in North Central, 17(9.7%) in South-South, 17(5.7%) in South East,

Table 2: Knowledge of the respondents on nutrition-related counselling during COVID-19

Variable	Correct n (%)	Incorrect n (%)	Variable	Correct n (%)	Incorrect n (%)
1 Should all patients have nutritional screening during COVID-19 pandemic?	89 (50.6)	87 (49.4)	9. Pre-infection, all individuals should aim at increased intakes of fruits and vegetables rich sources of vitamin A, D, E, C, B6, B12, Zn, Se, Fe.	168 (95.5)	8 (4.5)
2 Only high-risk patients should have nutritional screening and assessment during COVID-19 pandemic?	94 (53.4)	82 (46.6)	10 Vitamin A intake can be increased by consuming pawpaw, carrots,	166 (94.3)	10 (5.7)
3 Optimisation of nutritional status is vital for all individual?	171 (97.2)	5 (2.8)	11 Green leafy vegetables (Spinach; igbagba) are rich in zinc	144 (81.8)	32 (18.2)
4 Individuals with malnutrition should ensure supplementation with vitamin A, D and other micronutrients?	169 (96.0)	7 (4.0)	12 Mushrooms, egg yolk, liver are rich in vitamin E	126 (71.6)	50 (28.4)
5 When in quarantine, regular physical activity should be taken without precautions?	144 (81.8)	32 (18.2)	13 Eating certain fish and increased source of omega 3-fatty acids is beneficial	170 (96.6)	6 (3.4)
6 Should infected individuals have 20% increased intakes from healthy energy sources?	90 (51.1)	86 (48.9)	14 Exposure to early morning sunlight is the best to boost serum Vitamin D levels of individuals	165 (93.8)	11 (6.2)
7 Protein intake should be increased to above 1.0g/kg/ day, normal requirement?	69 (39.2)	107 (60.8)	15 Red meat is not a rich source of in Zinc	93 (52.8)	83 (47.2)
8 Increased intakes of citrus are not very important in boosting immunity during COVID-19 pandemic?	141 (80.1)	35 (19.9)	16 Fruits and vegetables should be washed cautiously, unlike pre-COVID-19 period.	58 (33.0)	118 (67.0)

5(2.8%) in North East while 8(4.5%) received medical training outside the country.

Knowledge of respondents about nutrition-related concerns during COVID-19

Majority (>70%) of the respondents responded correctly to questions on “Optimisation of nutritional status 171(97.2%), Supplementation of individuals with Vitamin A, D and other micronutrient 169(96.0%), Regular physical activity is needed in quarantine 144(81.8%), Increased intake of citrus is not very important in boosting immunity during COVID-19 141(80.1%). All individuals should aim at increased intakes of fruits and vegetables 168(95.5%), Vitamin A intake can be increased by consuming pawpaw, Zinc rich vegetables 166 (94.3%), Eating omega-3 fatty acids fish sources are beneficial 170 (96.6%) and Exposure to morning sunlight is best to boost Serum Vitamin D

Table 3: Knowledge of the respondents on food items rich in selected nutrients of importance as regards COVID-19

Variables	Scored 0 n (%)	Scored 1 n (%)	Scored 2 n (%)
1. Vitamin A	8 (4.5)	104 (59.1)	64 (36.4)
2. Vitamin D	81 (46.0)	69 (39.2)	26 (14.8)
3. Vitamin C	0	106 (60.2)	70 (39.8)
4. Vitamin E	88 (50.0)	58 (33)	30 (17)
5. Vitamin B6	37 (21.0)	99 (56.2)	40 (22.7)
6. Vitamin B12	92 (52.3)	56 (31.8)	28 (15.9)
7. Zinc (Zn)	63 (35.8)	99 (56.2)	14 (8.0)
8. Selenium	43 (24.4)	108 (61.4)	25 (14.2)
9. Iron (Fe)	43 (24.4)	107 (60.8)	26 (14.8)

165 (93.8%), mushrooms, egg yolk, liver are rich in Vitamin E 126 (71.6%)”.

Table 4: Attitude of respondents to nutrition-related counselling during COVID-19

Variable	Agree n (%)	Disagree n (%)	Variable	Agree n (%)	Disagree n (%)
1 I know all that is to be known on nutrition care of a patient as regards COVID-19 pandemic	30 (17.0)	146(83.0)	9 High intakes of fruits and vegetables are beneficial to increase Vitamin and minerals in individuals before, during and post-COVID-infection	165 (93.8)	11 (6.2)
2 Not screening my patient's nutritional status can increase their risk of contracting COVID-19 infection	99 (56.2)	77 (43.8)	10 Knowing the various food types that can improve immunity can help prevent and aid recovery from COVID-19 infection	156 (88.6)	20 (11.4)
3 Low immunity can lead to increased risk of contracting COVID infection	154 (87.5)	22 (12.5)	11 I know I should provide nutritional advice to the patient, but I do not know how to.	49 (27.8)	127 (72.2)
4 Inadequate dietary intake of energy, protein and selected micronutrients can predispose to viral infections	157 (89.2)	19 (10.8)	12 Nutrition specialist is not available for me to refer patients to	45 (25.6)	131 (74.4)
5 Low vitamin D status can worsen the risk of COVID -19 infection	108 (61.4)	68 (38.6)	13 I do advise my patients to increase the consumption of nutritious foods	156 (88.6)	20 (11.4)
6 Imbalance in omega fatty acid can predispose to viral infections	105 (59.7)	71 (40.3)	14 I have watched health shows/attended webinars that advise on appropriate nutrition recommendation during COVID-19 pandemic	73 (41.5)	103 (58.5)
7 Optimising nutritional status of all patients is critical	162 (93.8)	14 (8.0)	15 I can increase my interest in nutrition to help my patients	166 (94.3)	10 (5.7)
8 Increasing energy intake from healthy sources will not prevent them from having COVID infection	103 (58.5)	73 (41.5)	16 I can start educating my patients on healthy eating to prevent and support the treat COVID-19 infection	164 (93.2)	12 (6.8)

More than half (50-60%) of the respondents responded correctly to questions on “All patients should have nutritional screening during COVID-19

pandemic 89(50.6%). Only high-risk patients should have nutritional screening and assessment 94(53.4%), Infected individuals should have 20% increased intakes

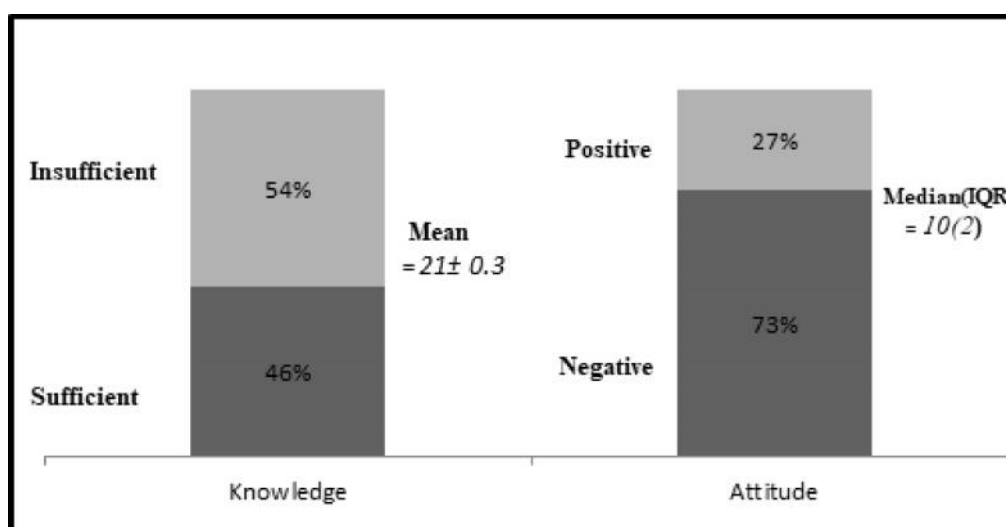


Figure 1: Knowledge and Attitude Categories of the respondents

Table 5: Association between knowledge categories of respondents and cadre, gender, place of practice, years of practice

	KNOWLEDGE			X ²	p		
	Total	Insufficient	Sufficient				
n(%)							
Cadre							
House Officer	6 (3.41)	5 (5.26)	1 (1.23)	5.948	0.311		
Medical Officer	13 (7.39)	7 (7.35)	6 (7.41)				
Senior/Principal/Chief Medical Officer	17 (9.66)	10 (10.50)	7 (8.70)				
Registrar	31 (17.61)	19 (20.0)	12 (14.81)				
Senior Registrar	39 (22.16)	23 (24.3)	16 (19.75)				
Consultant	70 (39.77)	31 (32.6)	39 (48.1)				
Gender							
Male	79 (44.89)	52 (54.7)	27 (33.33)			8.096	0.004*
Female	97 (55.11)	43 (45.3)	54 (66.67)				
Place of Practice							
Private/NGO	34 (19.32)	15 (15.79)	19 (23.46)	1.899	0.387		
Government	56 (31.82)	33 (34.74)	23 (28.40)				
Teaching Hospital	86 (48.86)	47 (49.47)	39 (48.14)				
Years of Practice							
< 20 years	138(78.41)	76 (80.0)	62 (76.54)	0.309	0.579		
>20 years	38 (21.59)	19 (20.0)	19 (23.46)				
Total	176 (100)	95 (54.0)	81 (46.0)				

from healthy energy sources 90(51.1%), Red meat is not a rich source of zinc 93(52.8%), and Herbal supplements are appropriate for prevention and treatment of COVID-19”.

However, (>60%) of the respondents responded incorrectly on questions that centre on protein intake should be increased to above 1.0g/kg/day 107(60.8%) and fruits and vegetables should be washed cautiously unlike pre-COVID-19 period 118(67.0%).

Knowledge of the respondents on food items rich in selected nutrients of importance as regards COVID-19

The percentages of respondents that mentioned two correct examples of food items rich in these nutrients are as shown in Table 3: Vitamin A (36.4%), Vitamin D (14.8%), Vitamin C (39.8%), Vitamin E (17.0%), Vitamin B6 (22.7%), Vitamin B12 (15.9%), Zinc (8.0%), Selenium (14.2%) and Iron (14.8%).

These were the percentages of respondents that mentioned at least one correct examples of food items rich in these nutrients: Vitamin A (59.1%), Vitamin D (39.22%), Vitamin C (60.2%), Vitamin E (33%), Vitamin B6 (56.2%), Vitamin B12 (31.8%), Zinc (56.2%), Selenium (61.4%) and Iron (60.8%).

The following respondents were unable to mention any correct examples of food items rich in these nutrients: Vitamin A (4.5%), Vitamin D (46.0%), Vitamin E (50%), Vitamin B6 (21.0%), Vitamin B12 (52.3%), Zinc (35.8%), Selenium (24.4%) and Iron (24.4%).

The attitude of respondents to nutrition-related counselling during COVID-19

The attitude of respondents to nutrition-related counselling during COVID-19 is shown in Table 4. Majority (>80%) of the respondents agreed to statements that centred on “perceived willingness to start educating patients on healthy eating 164 (93.2%), increasing interest in nutrition 166 (94.3%), and advising patients to increase consumption. One hundred and fifty-six (88.6%) agreed to know the various food types that can improve immunity, 165 (93.8%) agreed to know the intake of fruits and vegetables are beneficial, and 162 (93.8%) agreed to the importance of optimising nutritional status of all patients. While 157 (89.2%) agreed to know that inadequate dietary intake of energy and protein can predispose to viral infections, 154 (87.5%) agreed to low immunity can lead to increased risk of contracting COVID-19”.

Many (40-65%) of the respondents agreed to statements that centred on “I have watched health shows on nutrition 73(41.5%), increasing energy intake

Table 6: Association between attitude categories of respondents and cadre, gender, place of practice, years of practice

	ATTITUDE			X ²	p
	Total	Positive	Negative		
Cadre					
House Officer	6 (3.41)	1 (2.08)	5 (3.91)		
Medical Officer	13 (7.39)	3 (6.25)	10 (7.81)		
Senior/Principal/Chief Medical Officer	17 (9.66)	7 (14.58)	10 (7.81)		
Registrar	31 (17.61)	8 (16.67)	23 (17.97)		
Senior Registrar	39 (22.16)	8 (16.67)	31 (24.22)		
Consultant	70 (39.77)	21 (43.75)	49 (38.28)	3.307	0.653
Gender					
Male	79 (44.89)	23 (47.92)	56 (43.75)		
Female	97 (55.11)	25 (52.08)	72 (56.25)	0.245	0.621
Place of Practice					
Private/NGO	34 (19.32)	9 (18.75)	25 (19.41)		
Government	56 (31.82)	13 (27.08)	43 (33.47)		
Teaching Hospital	86 (48.86)	26 (54.17)	60 (47.12)	0.856	0.652
Years of Practice					
< 20 years	138 (78.41)	37 (77.08)	101 (78.90)		
>20 years	38 (21.59)	11 (22.92)	27 (21.09)	0.690	0.793
Total	176 (100)	48 (27.3)	128 (72.7)		

NGOs: Non-Governmental Organisation

will prevent them from having COVID-19 infection 103(58.5%), and imbalance in omega-3 fatty acids can predispose to viral infections. While 108(61.4%) agreed to low vitamin D status can worsen the risk of COVID-19 infection, and 99(56.2%) agreed that not screening my patient's nutritional status can increase their risk of contracting COVID-19".

Few (<40%) of the respondents agreed that Nutrition specialists are not available 45 (25.6%), 49 (27.8%) agreed to the statement that "I know I should provide some form of nutritional advice to my patients, but I do not know how to, and 30 (17.0%) agreed to "I know all that is to be known on nutrition care of patients".

Knowledge and Attitude categories of the respondents

Almost half (54.0%) of the respondents had insufficient knowledge, while 46.0% had sufficient nutrition-related knowledge about COVID-19 treatment guidance, as shown in Figure 1. The majority (72.7%) of the respondents had a negative attitude, while 27.3% had a positive attitude to nutrition counselling of patients regarding COVID-19.

Relationship between variables

Table 5 shows females had significantly better and sufficient knowledge about nutrition-related issues of

COVID-19 (p=0.004). However, there were no significant differences between knowledge of nutrition-related issues and cadre, place of practice, years of practice and knowledge of the respondents. Table 6 also revealed no significant difference in the respondents' attitude based on professional cadre, gender, place of practice, and years of practice.

DISCUSSION

The study investigated doctors' knowledge on nutrition-related issues of COVID-19 pandemic based on WHO recommendation and the ESPEN guidance 2019. It also explored doctors' attitude to offering nutritional counselling to patients seen during the COVID-19 pandemic using the health belief model. The study reported about half of the respondents showed sufficient knowledge regarding nutrition in relating to COVID-19, and most had negative attitudes regarding nutrition counselling of patients during COVID-19. Studies have documented that nutrition, food, herbals, nutrients, and supplements support body metabolism and maintain health. In COVID-19 infection, the goal of nutrition is to reduce disease severity and progression while improving recovery during the course of the disease.²⁰ There was no significant difference in respondents' nutrition knowledge and attitude based on individual characteristics except that females demonstrated sufficient knowledge than males. Similarly, females have

demonstrated higher knowledge regarding COVID-19 preventive measures in a population study that explored the knowledge of the Kingdom of Saudi Arabia (KSA) about COVID-19 preventive measures.²¹

In about half of the nutrition knowledge questions, most of the respondents scored excellently regarding the need for; optimisation of nutritional status, supplementation of individuals with Vitamin A, D and other micronutrients. Regular physical activity is needed in quarantine, increased intake of citrus is not very important in boosting immunity during COVID-19, all individuals should aim at increased intakes of fruits and vegetables, vitamin A intake can be increased by consuming pawpaw, zinc-rich vegetables, and eating omega-3 fatty acids fish sources are beneficial.²² Exposure to morning sunlight is best to boost serum vitamin D. The key to maintaining a functional immune system during a viral pandemic is to avoid deficiencies in nutrients involved in immune cell triggering, interaction, differentiation, or functional expression.²³ However, as regards mentioning examples of the selected nutrient needs meant to be conveyed to patients during counselling, the respondents could not mention more than one or not mentioned at all. Also, in the study even though a most of the respondents agreed that they provide some forms of nutritional advice to their patients, the content of such advice may not be optimal in that most of the respondents were not able to mention the common locally available examples of food items containing specific nutrients of importance as regards boosting immunity. In respect of this, a negative attitude was reported in that most respondents disagreed that they know they should provide some form of nutritional advice generally to patients but do not know how to do so. It is essential that during nutrition counselling, specifying common food items that contain nutrients needs to be communicated to the patients.¹⁶ For example, eat more fruits like mangos and pawpaw, do more cooking with palm-oil to increase your Vitamin A intake, rather than inform patients to eat foods rich in vitamin A. The counselling approach of specifying common foods rich in the required nutrients to boost immunity is further supported by a report that most severe cases of COVID-19 infection in Wuhan demonstrated elevated levels of infection-related biomarkers and inflammatory cytokines.²⁴ Thus, now more than ever, broader access to healthy foods should be a top priority, and individuals should be mindful of healthy eating habits to reduce susceptibility to and long-term complications from COVID-19.²⁵

In this study, the respondents demonstrated positive attitude as reported in that most of the respondents

disagreed that they know all that is to be known on nutrition care of a patient regarding COVID-19 pandemic and willing to increase their interest in nutrition to help patients. Only about half have watched health shows and undertaken webinars on nutrition in COVID patients and considered it needful to improve their nutritional knowledge and empower them to start educating patients on healthy eating to prevent and support the treatment of COVID-19 infection. Although most of the respondents in the study responded that they have access to nutrition specialists to refer patients to during the pandemic, this may not represent what is happening all over the country. Most of our respondents are specialist medical practitioners (consultant cadre), most likely working in teaching hospital settings, which is the only level of health facilities in Nigeria with guaranteed dieticians and nutrition-specialist employment. It is also necessary that Low and Middle-income Countries learn from challenges in clinical nutrition practice from other advanced settings of the world by adopting simple and easily applicable nutrition protocols.²⁶

STRENGTH & LIMITATION

This is the first study in Nigeria shedding insight into how doctors perceive the role of nutrition in COVID-19 treatment and prevention. However, it has limitations in that the response rate was less than average, which is a common trend in online surveys in Low and Middle-income Countries. Perhaps, this is due to the poor internet connection and high internet tariffs. Some of the findings may not be generalizable across all doctors in Nigeria, as most of the respondents were from teaching hospital settings.

CONCLUSION

In conclusion, respondents were deficient in knowing common food items containing relevant nutrients essential for boosting immunity. They also demonstrated a negative attitude as regards the needs for acquiring more nutrition knowledge. The study finding helped identify areas of deficit that could serve as a template for educational intervention. To ensure physicians are better equipped in nutritional counselling, more training sessions on nutrition and COVID-19 infection should be explored by the various institutions and professional bodies such as the Nigerian Medical Association as Continuing Medical Education. Hence, will be a positive step towards the ESPEN guidance on Covid-19 that encourage all nutrition specialists to communicate this line of adjunct treatment to other cadres of health care personnel involved in patients' care during this pandemic.

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