

# Nutrition knowledge and attitude of Babcock University medical and nursing students and Inter-professional collaboration with Dietitians in patient care

Ani IF<sup>1</sup>[ID](#), Adetola AB<sup>2</sup>[ID](#), Ajuzie NC<sup>1</sup>[ID](#), Sam-Okere M<sup>1</sup>

<sup>1</sup> Department of Nutrition and Dietetics, Babcock University Ilishan-Remo, Ogun state, Nigeria

<sup>2</sup> Department of Dietetics, Babcock University Teaching Hospital Ilishan-Remo Ogun State, Nigeria

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## Abstract

**Objective:** The study assessed nutrition knowledge and attitude of final year medical and nursing students and inter-professional collaboration with dietitians in the management of patients.

**Methodology:** This cross-sectional study of all final year medical and nursing and Babcock University students collected quantitative data using a structured questionnaire that contains sections on nutrition instruction hours, knowledge, attitude, and barriers to nutrition. Data obtained was analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Statistics were significant at  $p < 0.05$ .

**Result:** A total of 159 students participated in the study, 73 medical students and 86 nursing students. The proportion of those who had good, average, and poor knowledge scores were 50.3%, 39%, and 10.7% respectively. The attitude towards nutrition was positive. There was no significant relationship between nutrition knowledge and nutrition instruction hours during pre-clinical ( $P=0.368$ ) and clinical years ( $P=0.245$ ).

**Conclusion:** Significant proportions of the students had good nutrition knowledge, however, there were gaps in knowledge in clinical nutrition; nutritional management of diabetes, hypertension, and renal diseases, respectively. There was a high positive attitude towards nutrition among the students but nutrition education was not perceived as sufficient to adequately prepare them for nutrition care of patients. Insufficient training for doctors and nurses, lack of confidence in the efficacy of the intervention of dietitians/nutritionists, and Lack of interest from patients to see the dietitian were the prominent barriers to inter-professional collaboration with dietitians/nutritionists.

**Keywords:** nutrition knowledge, attitude, medical student, nursing student, barriers

## Plain English Summary

The study assessed the nutrition knowledge and attitude of Babcock university medical and nursing students on inter-professional collaboration with dietitians in the management of patients using a cross-sectional design. The present study revealed that the students had a positive attitude towards nutrition. Half of the participants had good nutrition Knowledge, However, there were gaps in knowledge in clinical nutrition; nutritional management of diabetes, hypertension, and renal diseases respectively. Also, nutrition education is not perceived as sufficient for both professions.

Correspondence:

Ani, Ime F

Department of Nutrition and Dietetics, Babcock University Ilishan-Remo, Ogun state, Nigeria

+2348034057303, [anii@babcock.edu.ng](mailto:anii@babcock.edu.ng)

## Background

Malnutrition (which includes undernutrition, overnutrition, and micro-nutrient deficiency) and disease-related malnutrition are evident public health problems globally (1) as the rates keep increasing, resulting from poor dietary habits, and economic factors, and other apposite environmental considerations. Nutrition is most needed now as the rates of diabetes mellitus and obesity keep increasing over the years (2), and is undoubtedly detrimental to the effort to reduce micronutrient deficiency and general malnutrition. As of 2020, a global report has it that 149 million children between ages 0-5 were stunted, 45 million were wasted and 38.9 million were recorded to be obese or overweight. It was also discovered that 45% of infant deaths are linked to undernutrition (3). Globally, Nigeria has been recorded to have the second-highest burden of stunted children with a national prevalence rate of 32% in children between 0-5. A rough estimate of 2 million children suffer from Severe Acute Malnutrition (SAM) in Nigeria but unfortunately, only 2 out of every 10 affected children are treated properly (4). The pivotal increment of diet-related diseases will undoubtedly increase the rates of morbidity and the costs of treatment as well. Considering the country's economic growth trend, it is only rational to tackle this problem by improving individual dietary habits.

World Health Organization has recommended that medical professionals should be supported by taking up an active role to promote healthy eating habits (5). It is at this point that the dietitians and nutrition educators intervene to cause a decline in the rapid spike. Dietitians, who are trained health professionals, treat medical conditions and promote the nutritional well-being of individuals through nutrition therapy. This requires more than just information provision but rather consistent long-term support to maintain the newly initiated regime (6, 7).

Doctors confirm that nutrition is a vital aspect of health and it is enlisted among their several responsibilities (8, 9, 10, 11). However, providing sufficiently detailed nutrition advice which is relevant to a patient's health goals is not common in practice settings.

The knowledge of nutrition care by doctors is important to foster teamwork with other health workers, especially the dietitians in promoting healthy dietary habits, and such interventions can lead to decreased rate of disease morbidity, mortality, and medical expenses in general. However, medical students report inadequate

nutrition education during their training at school (12). There is a dearth of information regarding nutrition knowledge in medical schools in Nigeria and because of this, this study aims at carrying out an empirical evaluation of the knowledge base of medical students at Babcock university, as demonstrated by their knowledge.

## Methods

The cross-sectional study was conducted at Babcock University, Ilishan-Remo in Ikenne Local Government Area of Ogun State, Nigeria. The official language of communication at Babcock University is English. Therefore, the research and interaction with the participants were done in English. The study population was medical and nursing students. The study adopted a total sampling technique, the total number of all final year medical and nursing students was used in the study. All final-year medical and nursing students were included in the study. Final-year students unwilling to participate were excluded from the study. The data for this study were collected using a structured questionnaire developed and validated by Cardenas et al., (13). The instrument elicited responses on participants' socio-demographic characteristics, nutrition instruction received in pre-clinical years, nutritional knowledge, attitudes towards the clinical practice of nutrition, and barriers encountered in practicing nutrition referral. The students' knowledge status was evaluated with 15 points by giving a score in the right answer for each item with the data collection tool. One point was given to each correct answer, whereas wrong answers were not given any points. The total knowledge score was 15 and the mark 1-5 out of 15 was considered poor, 6-10 as average, and 11-15 as good. Data were analyzed using IBM SPSS version 20. Descriptive statistics like percentages, mean and standard deviation were used. The Chi-square test was used to find an association between proportions and a p-value of <0.05 was considered statistically significant.

## Result

A total of 159 students participated in the study. The ages of the respondents ranged from 19-27 years with a mean age of  $21 \pm 1.6$  years. Sex distribution showed males making up 29.6% and females 70.4%. More than half (54.1%) of the students were studying nursing science while 45.9% were studying medicine. The majority

(97.5%) of the students were single while 2.5% were married. (Table 1)

**Table 1: Socio-demographic characteristics**

Variables N=159		N	%
Sex	Male	47	29.6
	Female	112	70.4
Age (years)	19-21	105	66.0
	22-24	47	29.6
	25-27	7	4.4
Mean age	21±1.6 years		
Course of study	Medicine and surgery	73	45.9
	Nursing science	86	54.1
Marital status	Single	155	97.5
	Married	4	2.5

Table 2 showed that eighty-three (52.2%) and 78(51.0%)of the students reported 2-4 hours as the instruction hours for nutrition during pre-clinical and clinical years respectively while 19.5%

reported they had no nutrition class. Seventy eight (49.1%) considered nutrition teaching sufficient.

**Table 2: Nutrition instruction hours**

Variables		N	%
Instruction hours in pre-clinical years	< 2 hours	49	30.8
	2-4 hours	83	52.2
	None	27	17.0
Instruction hours in clinical years	< 2 hours	50	32.7
	2-4 hours	78	51.0
	None	31	19.5
Consider nutrition teaching sufficient	Yes	78	49.1
	No	46	28.9
	I don't know	35	22.0

Half; 80 (50.3%) of the participants had good knowledge of nutrition, 62 (39%) had average

scores while 17 (10.7%) had poor knowledge of nutrition. (Table 3)

**Table 3: Nutrition knowledge Score**

Variable	N	%
Good	80	50.3
Average	62	39.0
Poor	17	10.7

Ninety-seven (61.0%) of the respondents do not know that diet modification is needed in the management of sarcopenia, and 55.3% do not know that chronic consumption of food additives may cause cancer. Half the respondents

80(51.3%) do not know that consuming trans-fat from food can increase the risk of heart disease and 116(73%) do not know that a balanced diet is what is needed to maintain a healthy weight. (Table 4)

**Table 4: Nutrition knowledge**

Questions	Correct n (%)	Incorrect n (%)
The formula to calculate body mass index	123(77.4)	36(22.7)
Cholesterol and saturated fat plays a role in increasing blood lipid	139(87.4)	20(12.6)
Genetics, diet, and medications do not play a role in weight loss	123(77.4)	36(22.7)
Diet modification is needed in the following conditions except; Diabetes, CKD, hypertension, dyslipidemia, malaria	113(71.1)	46(29.0)
Diet modification is key in the management of sarcopenia	62(39.0)	97(61.0)
Which of these diseases is related to a low intake of fiber? high blood pressure, tooth decay, and anemia.	130(81.8)	29(18.2)
Which of these diseases is related to how much sugar people eat? high blood pressure, tooth decay, anemia.	124(78.0)	35(21.9)
Which of these diseases is related to how much sodium people eat? hypothyroidism, diabetes high blood pressure	116(73.0)	43(27.4)
Which of these options do experts recommend to reduce the chances of getting cancer? drinking alcohol, eating less red meat, avoiding additives in food;	71(44.7)	88(55.3)
Which of these do experts recommend to prevent heart disease? taking nutritional supplements, eating less oily fish, eating less trans fats	79(49.7)	80(51.3)
Which of these options do experts recommend to prevent diabetes? less refined foods, more fruit juice, processed meat	107(67.3)	52(32.7)
Which of these foods is more likely to raise people's blood cholesterol? eggs, vegetable fats, animal fats	94(59.1)	65(40.9)
Which ones of these foods are classified as having a high glycaemic index? whole-grain cereals, white bread, fruit, and vegetables	103(64.8)	56(35.2)
To maintain a healthy weight, people should cut out fat completely	125(78.6)	34(21.4)
To maintain a healthy weight, people should eat a high-protein diet	43(27.0)	116(73.0)

As shown in table 5, the majority of the respondents 153(95.6%) believed it was their responsibility to advise patients about their diet, and they agreed that they could apply what they learned in nutrition to their work. However, they agreed they were obligated to improve the health of their patients through referral to a nutritionist for counseling. Most of the respondents agreed they could identify patients who needed lifestyle and diet modifications and could carry out adequate nutrition evaluation and screening tools.

Slightly above half, 83(52.2%) of the respondents agreed that the training on nutrition for doctors was not enough while 131 (82.4%) agreed that insufficient training was a barrier to nutrition practice. Most of the respondents 142(88.5%) believed a lack of interest from patients to visit a dietitian/nutritionist was a barrier to collaborating with a nutritionist in patient management and 117(73.3%) reported a lack of confidence in the efficacy of the intervention of dietitians/nutritionist as a barrier.

**Table 5: Attitude and barriers to nutrition practice**

Variables	Agree N (%)	Indifferent N (%)	Disagree N (%)
As a physician, it is my responsibility to advise patients about diet and nutrition	153(96.2)	3 (1.9)	3(1.9)
I should improve the health of my patients, even by referring to a dietitian/nutritionist for nutrition counseling and diet modifications	151(95.0)	4(2.5)	4(2.5)
Nutrition counseling should be part of the routine care of all patients.	138(86.8)	18(11.3)	3(1.9)
Nutrition assessment and counseling should be included in any routine visit.	134(84.2)	19(11.9)	6(3.7)
I can apply what I have learned about nutrition to my work	147(92.5)	6(3.8)	6(3.7)

My training and education have adequately enabled me to discuss nutrition issues with nutritionists/dietitians and also with my patients.	131(82.3)	16(10.1)	12(7.6)
During a consultation, physicians have little impact on the patient's ability to lose weight	65(40.9)	27(17.0)	67(52.2)
I think there is enough nutrition training for doctors in my country	43(27.0)	33(20.8)	83(52.2)
All patient do not need nutrition counselling	40(9.9)	17(10.7)	102(64.2)
<b>I feel comfortable and competent about the following:</b>			
Identifying patients who need lifestyle and diet modifications.	132(83.0)	19(11.9)	8(5.1)
Identifying patients who need diet therapy	125(78.6)	27(1.7)	7(4.4)
Identifying patients who need nutrition supplements	114(71.7)	38(23.9)	7(4.4)
Applying a nutrition screening tool	113(71.1)	34(21.4)	12(7.6)
Carrying out an adequate nutrition evaluation	110(69.2)	30(18.9)	19(11.9)
<b>Barriers to nutrition practice</b>			
Insufficient training on nutrition	131(82.4)	18(11.3)	10(6.3)
Lack of interest from patients to visit dietitian/nutritionist	142(88.5)	11(6.9)	6(3.8)
Lack of confidence in the efficacy of the intervention of dietitians/nutritionists	117(73.7)	30(18.9)	12(7.5)
I consider that the advice on diet interferes with the privacy of the patient	70(44.0)	29(18.2)	60(37.8)
Lack of finances by the patient to see a dietitian/nutritionist	124(78.0)	20(12.6)	15(9.4)

There was no statistically significant association between nutrition knowledge score and nutrition instruction hours during pre-clinical (p=0.368) and clinical (p=0.245). There was a significant association between nutrition knowledge score

and course of study (p=0.017). Medical students had higher (28.3%) nutrition knowledge and a lower percentage of students (2.5%) with poor nutrition knowledge. (Table 6)

**Table 6: Association between nutrition instruction and knowledge score**

Variables	Knowledge score			X <sup>2</sup>	df	P-value
	Poor n (%)	Average n (%)	Good n (%)			
Course of study				8.10	2	0.017*
	Medicine	4(2.5)	24(15.1)	45(28.3)		
	Nursing	13(8.2)	38(23.9)	35(22.0)		
Pre-clinical nutrition Instruction hours				4.24	4	0.368
	<2 hours	4(2.6)	16(10.3)	29(18.7)		
	2-4	8(5.2)	34(21.9)	41(26.5)		
	None	4(2.6)	11(7.1)	8(5.2)		
Clinical nutrition instruction Hours				15.23	6	0.245
	<2 hours	5(3.3)	15(9.8)	30(19.6)		
	2-4	7(4.6)	32(20.9)	39(25.5)		
	None	4(0.7)	14(9.2)	7(4.6)		

\*Statistics significant at p<0.05

**Discussion**

In the present study, we determined the nutrition knowledge and perception of Babcock university medical and nursing students on inter-professional collaboration with dietitians in the management of patients at Babcock University Ogun, Southwestern Nigeria. There were more females than males in our studied sample.

The nutrition instruction hours in pre-clinical and clinical years for both nursing and medical students ranged between two to four hours. There were differing responses from the students as some reported that the instruction hours were less than two hours and some students reported not having any nutrition classes for both clinical and pre-clinical years. These discrepancies in

responses highlight the importance attached to nutrition classes as some students may not attend classes because they might feel it is less important or not required for their profession. However, Chung et al., (14) reported in their study that nutrition education in some form was required in most medical schools, with an average of 23.68 hours provided. Also, Gomathi et al. (15) reported that nutrition education was perceived to be very important by the majority of students. However, Orimo et al. (16) in their study conducted in Japan reported that few medical schools offered dedicated nutrition courses; over half offered nutrition in other courses; very few schools did not offer any nutrition education, and very few schools dedicated more than 5 hours to nutrition education. Interestingly in this present study, despite the low nutrition instruction hours reported by the students, most of them felt the general nutrition education they received was enough. This perception needs to be corrected by apportioning appropriate hours for nutrition and making nutrition a required course in medical and nursing schools.

One-quarter of the students had average nutrition knowledge while half of the students had good nutrition knowledge. This is similar to a study by Castillo et al. (17) where half of the students also had good knowledge and contrast to Hargrove et al. (18) who reported a high percentage of medical students with good knowledge of nutrition. However, in this present study, there were gaps in some aspects of nutrition. Most of the respondents do not know that a balanced diet is needed to maintain a healthy weight as they all reported a high protein diet to be essential for a healthy weight. There were gaps in knowledge amongst the students in the nutritional management of sarcopenia, Diabetes, Hypertension, kidney diseases, and calculation of body mass index. Furthermore, some of the students do not know that these disease conditions needed dietary modification and co-management with dietitians. Some of these gaps were also identified by Gomathi et al. (15) where most of the students felt they had not received adequate instruction in nutrition; major areas of deficit included clinical nutrition, nutrition in primary care, and evidence-based nutrition. These gaps in knowledge need to be filled by improving nutrition curricula in the professions. Most of the students couldn't identify specific food items that need to be modified in certain disease conditions which indicates a need for collaborative management of a patient with dietitians. However, Perlstein et al. (19) reported

in their study that the majority of students were able to identify recommendations for daily servings of foods; including fruits and vegetables. The general attitude of the students towards nutrition was positive, although a few percentages had a negative attitude while some were indifferent. More than three-quarters believed nutrition assessment and counseling should be included in any routine visit. This was also reported by Schoendorfer et al. (20) in his study where medical students indicated that high-risk patients should be routinely counseled in nutrition, nutrition counseling should be routine practice, and routine nutritional assessment and counseling should occur in general practice.

Slightly above half said there was insufficient nutrition training for doctors in Nigeria. This was similar to the findings of Cardenas et al. (21) on Nutrition in medical education in Latin America, where the medical students also had positive attitudes toward nutrition but insufficient nutrition training for doctors.

Almost half of the respondents reported that physicians have little impact on the patient's ability to lose weight, for patients who needed weight loss and some of the students could not recall the formula for calculating BMI. This poor knowledge and wrong belief would lead to the inability to identify and manage a patient who needed weight loss appropriately and sustainably. It may also affect the patient-physician relationship because the motivation patient needed may not be available to them as the physician may not feel obligated to motivate them. Similarly, Metcalf et al. (22) reported in their study that medical students' knowledge about basic skills (e.g., measuring waist circumference) varied widely; about half of the students did not feel knowledgeable about recommending weight-loss treatments; most students felt it was their role to provide interventions for patients in various categories of overweight or obesity, but did not feel prepared to provide these interventions.

Most of the respondents agreed they could identify patients who needed lifestyle, diet modification, and diet therapy but the most elicited barriers to inter-professional collaboration with dietitians were insufficient nutrition training, lack of confidence in the efficacy of the intervention of dietitians/nutritionists, lack of interest from patients to visit dietitian/nutritionist, and they believe that the diet advice interferes with the privacy of the patients. Similarly, Mogre et al. (23) stated in their study that medical students reported interpersonal factors such as poor collaboration with nutrition professionals in

medical education; and environmental factors like lack of faculty to provide nutrition education as barriers to nutrition. These elicited barriers are gaps that can be filled with proper knowledge of nutrition through improvement in nutrition curriculum, nutrition hours, and confidence in interventions rendered by other health professionals.

Medical students had better nutrition knowledge than nursing students as very few had poor knowledge scores. Although, there were gaps in some aspects of nutrition knowledge. There was no relationship between instruction hours on nutrition at pre-clinical and clinical levels with nutrition knowledge. This is similar to findings by Walsh et al. (24) in his study, where he found that medical students' attitudes and nutrition knowledge were not affected by the model of nutrition education they receive, though students in an integrated curriculum may feel their education is inadequate and seek additional training. There are gaps in the nutrition knowledge of the students and the nutrition competencies with attitude needed for them to collaborate with other health care providers especially nutritionists to provide adequate nutrition care. Nasar et al. (25) also reported in their study that nurses and physicians were unable to provide effective nutrition intervention in health care settings and needed to improve their nutritional knowledge, attitude, and practices.

### Conclusion

The general nutrition knowledge was average, however, there were gaps in some aspects of nutrition. There was a high positive attitude towards nutrition among the students but nutrition education was not perceived as sufficient to adequately prepare them for nutrition care of patients. Insufficient training for doctors and nurses, lack of confidence in the efficacy of the intervention of dietitians/nutritionists, and lack of interest from patients to see the dietitian were the prominent barriers to inter-professional collaboration with dietitians/nutritionists. Student nurses and doctors are our future healthcare professionals and are usually the first point of contact with patients. Having good nutrition knowledge would enable them to spot nutritional risk factors for chronic disease early and intervene where appropriate, potentially reducing the burden of chronic disease. Appropriate nutrition education for medical and nursing professionals is likely to have a positive impact on patient care and health outcomes. Interventions to increase their nutrition knowledge can increase

the rates at which they discuss nutrition and its interventions with other health professionals.

### List of abbreviations

SAM: severe acute malnutrition  
WHO: world health organization  
BMI: body mass index

### Declarations

#### *Ethical approval and consent to participate*

Ethical approval was obtained from Babcock University Health Research Ethics Committee with approval number BUHREC #939/21#. Informed consent was obtained from every participant. Participants' names were excluded from the data information. The data gathered were used for research purpose only.

#### *Consent for publication*

The authors consented to the publication of the work under the creative commons CC, Attribution. Non-commercial 4.0 license.

#### *Availability of data and materials*

The datasets used and/or analyzed in this study are available from the corresponding author on reasonable request.

#### *Competing interests*

The authors declare no competing interests.

#### *Funding Statement*

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#### *Authors' contributions*

*Conceptualization- AI, AA; Data curation- SM, AA, AN; Methodology- AI, AA; Writing of manuscript- AI, AA; Review and editing- AI, AA, AN.*

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