

Knowledge and use of dietary supplements by students of College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria

Abstract

Rationale: Nutritional supplements are preparations intended to supplement the diet and provide nutrients. They include vitamins, minerals, fiber, fatty acids, or amino acids, that may be missing or may not be consumed in sufficient quantities in a person's diet. Many health professionals including dietitians, physicians and pharmacists are supplement users.

Objectives: The objectives of the present study were to determine knowledge and use of dietary supplements among students of College of Medicine, University of Lagos who are potential health professionals.

Methodology: A self-administered questionnaire with a mix of open and close ended questions was employed to collect data in this study. It was distributed to 300 students that were in their final year in various departments of the college.

Findings: Response rate was 89%. About 86% of the students have used dietary supplement before while half of them (50%) have used it in the past 12 months. The common types of dietary supplements used in the past 12 months are the vitamins. The reasons for use by the students were good health, poor diet, to boost immunity, weight gain and doctor's prescription. Most of the students were occasional and once in a while users.

Conclusions: Majority of the students were aware of dietary supplement use and most of them were occasional users.

Key words:

College of medicine, dietary supplement, knowledge, student

Introduction

It was the Nobel-laureate Linus Pauling that made a public claim in the 70's that megadoses of at least 10 times the recommended dietary allowance (RDA) of ascorbic acid could prevent/cure the common cold, flu and cancer.^[1] This claim, according to Camire and Kantor, may have stimulated the public interest in the use of vitamin supplements to enhance health.^[2]

In their historical overview of the use of dietary supplements, Camire and Kantor also noted that the most common dietary supplements were multivitamin/mineral formulations containing varying percentages of the RDAs for those nutrients until the mid-1990s.^[2]

The National Institute of Health's Offices of Dietary Supplements has defined dietary supplements as products intended to supplement the diet and which contain one or more dietary ingredients (including vitamins, minerals, herbs or other botanicals, amino acids and other substances) or their constituents.^[3]

Dietary supplements were defined in a law passed by Congress in 1994 called the Dietary Supplement Health and Education Act (DSHEA).^[4] DSHEA defines supplements and outlines quality, safety and efficacy regulations that are different from those for drugs. The U.S. Food and Drug Administration do not review dietary supplements for safety or effectiveness before they are sold. According to DSHEA, a dietary supplement is a product that is intended to supplement the diet and it is labeled as being a dietary supplement.^[5,6]

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The following are examples of dietary ingredients defined as dietary supplements by the DSHEA of 1994:^[2,5]

- “Vitamin: Vitamins A, D, E, C, B6, B12, thiamin, riboflavin, niacin, folate, biotin, pantothenic acid
- Mineral: Calcium, iron, zinc, magnesium, manganese, selenium, copper, chromium, iodine
- Herb or other botanical: Garlic, ginkgo, chamomile, dandelion, milk thistle, capsicum, valerian, yohimbe, guarana
- Amino acid: Lysine, tryptophan, cysteine, isoleucine, methionine, valine
- A dietary supplement used to supplement the diet by increasing the total dietary intake: Fish oil, blue-green algae, bee pollen, bone meal, melatonin
- Concentrates, metabolites, constituents, or combinations: Allicin (from garlic), ginkgo ginsenosides, bilberry extract, chamomile tea.”^[2,5]

Dietary supplements are now found in a much broader variety than before in supermarkets and national discount chain stores and are sold through mail order catalogues, television and the internet. Although some supplements such as prenatal vitamin/mineral blends require a prescription, most do not and are readily available as over-the-counter (OTC) products.^[2] People commonly take them to supplement diet, prevent illness, cure infection, reduce fever, heal wounds and treat diseases.^[7]

The demands of physical growth in young people can only be met by a balanced intake of nutrients and a lack or excess of any nutrient may lead to health problems later.^[8] The different life-styles of young people also contribute to their nutritional deficiency, e.g., smoking, which destroys certain vitamins in the body.

Many researches on dietary supplement use among other developed countries like USA have been carried out and are still going on.^[9-26] However, there is limited number of research on dietary supplement use in developing countries like Nigeria. This may imply poor awareness and/or an insignificant use of dietary supplement in our country thus necessitating the question as to awareness and use of dietary supplements among Nigeria populace. This then forms the basis for the aim of this research, to know if young adults and potential health professionals are aware of dietary supplements and whether they are using them, especially in the past 12 months. This research will also help to determine how often they use them, the reasons for their use and other factors associated with their use. These other factors will include the possible side-effects and interactions of dietary supplements when used with conventional medicines and physicians’ awareness of their patients’ use of dietary supplements.

The study was also aimed at identifying the students’ sources of information about dietary supplement, how important they think dietary supplements are and if they think dietary supplement should be encouraged.

Methodology

Study site

The study was carried out at the College of Medicine of the University of Lagos, Idi-Araba, Lagos.

Study design

A cross-sectional study targeting the whole population of study.

Study population

The study population was the final year students of various departments in the college of medicine irrespective of their ethnicity, background and socio-cultural belief. The departments include medicine, pharmacy, dentistry, pharmacology, physiotherapy, physiology and radiography.

Study instrument

A structured, self-administered, close ended and open ended questionnaire was employed for this study. The questionnaire was divided into three sections with a total of 24 questions.

Section A: Socio-demographic data

Section B: Knowledge on dietary supplement use

Section C: Usage of dietary supplement.

Sample size

A total of 300 questionnaires were shared to the students but only 268 students returned the questionnaires given to them.

Data analysis

Data generated from questionnaire was analyzed using SPSS 15.0 for windows Evaluation version (SPSS Inc., Chicago USA). Data analysis consisted of frequency analysis and cross tabulation for Chi-square (χ^2) to test for statistical significance.

Duration of study

The study was carried out between June 2011 and September 2011.

Ethical issues

Information obtained from respondents was held in strict confidence, hence names and other personal details were not asked for. Consent was sought from the students before being given the questionnaire.

Limitations

Some students declined participating in the study and some did not completely fill the questionnaire to make it usable.

Results

a. Frequencies

Majority of the respondents (65%) were in the age bracket of 21-25 years [Figure 1] and 47% of them were males while 53% were females [Figure 2]. According to their departments, 26% were medical students, 26% pharmacy students, 13% dental students, 9% pharmacology students, 9% physiotherapy students, 6% physiology and 8% radiography of the total respondents in this study. Most of the students were from the Yoruba tribe with 62%, 25% of them were from Igbo tribe, 8% from Hausa tribe and 3% from other tribes like Edo, Urhobo, Kalabari etc., Nearly 82% of the respondents are Christians while 16% are Muslims.

Table 1 contains data on knowledge and use of supplements. About 97% of the respondents have heard about dietary

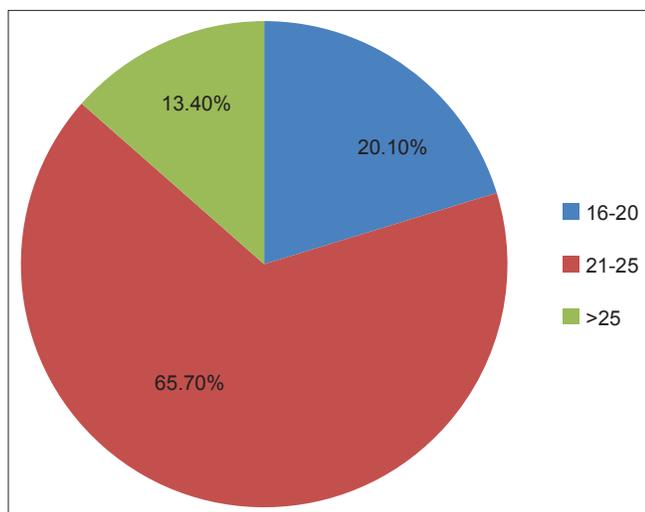


Figure 1: Age in years

supplement and their major source of information was from school (63%), multimedia, (41%), doctor (34%) and parent (22%). Over 60% of the students answered yes to whether dietary supplement can be used to substitute natural nutrients derived from foods. Almost half of the respondents (48.5%) rated dietary supplements as very important, 12.3% rated them as not important while 18% did not know how important dietary supplements are. Only about 14% of the respondents thought that there are side effects to dietary supplement use, 35% thought there are no side-effects and almost half of them (48%) were not sure if dietary supplements have side-effects or not.

Majority (86.9%) of the students have used dietary supplement before while 50% of the students have used dietary supplement in the past 12 months. About 84.0% felt dietary supplement should be encouraged.

Table 2 shows results on the factors associated with the use of dietary supplement in the past 12 months. The types of dietary supplement commonly used by these students were vitamin C, multivitamins, vitamin A, vitamin B12 and vitamin B complex. The most commonly used was vitamin C.

Amongst the students who are dietary supplement users in the past 12 months, most of them (63%) were occasional or once in a while users. The reasons for use given by these students were majorly for good health (58%), poor diet (35%), to boost immunity (34%), weight gain (26%), energy (36%) and compliance to doctor's prescription (16%).

Around 31% of these students reported taking prescription medication with dietary supplement while about 20% reported taking OTC medication with dietary supplement. Almost half of the students reported that their doctors were not aware of their use of dietary supplement. The major reason given was that they don't think it is necessary for their doctor to know about their dietary supplement use.

Only 10% of the students reported that they experience

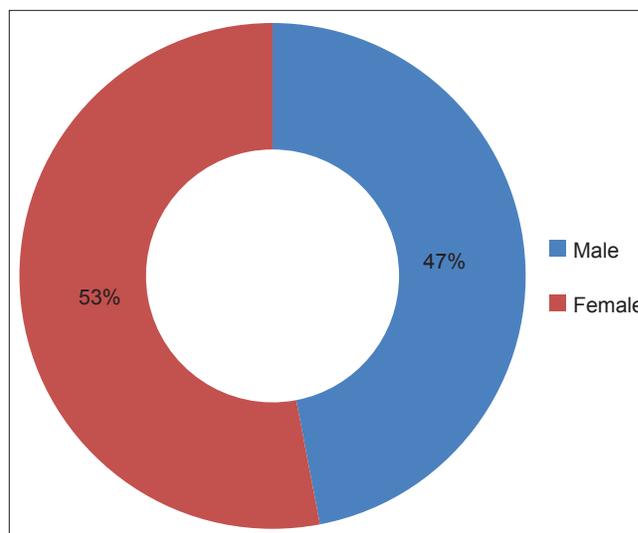


Figure 2: Gender

side-effects when taking dietary supplement. Among those that reported side-effects 35.7% were for bulimia, gastrointestinal tract (GIT) effects (35.7%) such as nausea, vomiting, diarrhea, constipation, central nervous system (CNS) effects (21.4%) such as headache, dizziness and black stool (7.1%).

b. Cross tabulations to test for statistical significance

Gender

When gender was cross tabulated with some factors related to dietary supplement use there was no statistically significant difference between males and females with regard to heard about dietary supplement, can be used to substitute, have side-effects, importance, taken in the past 12 months, how often taken, take with prescription drugs or OTC, experience side effects and doctor aware of dietary supplement taken, but there was statistically significant difference for having taken dietary supplement before ($P = 0.029$) [Table 3].

Departments

When departments were cross tabulated with some factors related to dietary supplement use, there was no statistically significant difference between the respondents from the different departments with regards to heard about dietary supplement, have side-effects, importance, taken in the past 12 months, how often taken, take with prescription drugs or, experience side-effects and doctor aware of dietary supplement taken but there was statistically significant differences for can be used to substitute ($P = 0.002$), having taken dietary supplement before ($P = 0.009$) and use with OTC ($P = 0.036$) [Table 4].

Discussion

The age bracket 21-25 which had the largest percentage of 65% was due to the limiting of this study only to final year students. There were more females than males that participated in this study. Most of the students were Christians and from the Yoruba tribe, this is probably due to the fact that the university is located in Yoruba speaking area of Nigeria.

The high percentage seen in the students who have heard about dietary supplements shows there is a high awareness of dietary supplement amongst the students and the highest source of information is from the school. The major source of information from school may be due to the medical nature of the training courses of the students and this may also be the reason why there was no statistically significant difference between the students as to the proportion of them that have heard about dietary supplement.

Almost two-thirds of the students said dietary supplement can be used to substitute natural nutrients derived from foods, indicates some knowledge deficiency because dietary supplements are supposed to supplement and not substitute natural nutrients from food. Almost half of the students felt dietary supplements are important while a small proportion of them opted for not important. Considering the category of these respondents, dietary supplement is important because they belong to the group that eat a lot of junk food which may lack the appropriate nutrients hence the need for dietary supplement. There was statistically significant difference among the students from the different departments on the basis of use as substitute and it is worth mentioning that the least proportion of those opting for use as substitute was among pharmacy students this may be due to the fact that dietary supplements are related to drugs, which is the major thrust of training in pharmacy.

Only about 14% of the students think there are side-effects to dietary supplements use and this indicates the students' lack of full and precise knowledge about dietary supplements because dietary supplements do have side-effects.^[7]

Emphasis was made on dietary supplement users in the past 12 months and half of the students had used dietary supplements in the past 12 months. The types of dietary supplement commonly used by these students were vitamin C, multivitamins, vitamin A, vitamin B12 and vitamin B complex. The use of these vitamins have been reported in other studies.^[15,16,20] The most commonly used was vitamin C then followed by multivitamins, this is contrary to other studies where multivitamin was the most commonly used followed by vitamin C and others.^[15,16] The use of vitamin supplements by these students is expected because they are more readily

available and easily accessible to them than the herbal or other supplements.

Amongst the students who are dietary supplement users in the past 12 months; a higher percentage of them use dietary

Table 2: Factors associated with dietary supplement use

Factors	Dietary supplement users in the past 12 months	
	N	Percentage
Common types of dietary supplement used		
Vitamin C	107	79.8
Vitamin B complex	71	52.9
Multivitamin	70	52.2
Vitamin A	42	31.3
Vitamin B12	37	27.6
Primary reasons for dietary supplement		
Good health	79	58.9
Poor diet	47	35.0
To boost immunity	46	34.3
Energy	36	26.8
Weight gain	35	26.1
Doctor's prescription	22	16.4
Do you take prescription medication with dietary supplement		
Yes	41	31.1
No	91	68.9
Do you take over-the-counter medication with dietary supplement		
Yes	27	20.5
No	105	79.5
Is doctor aware of dietary supplement use		
Yes	66	50.0
No	66	50.0
Reasons why doctor not aware of dietary supplement use		
Don't think it is necessary for your doctor to know	35	59.3
Feel your doctor may change the prescription	11	18.6
Your doctor did not ask	6	10.2
Fear of disapproval by your doctor	1	1.7
Don't know	2	3.4
Don't have a doctor	4	6.8
Do you experience any side effect with dietary supplement use		
Yes	14	10.8
No	116	89.2
What are the side effects experienced		
Bulimia	5	35.7
GIT effects	5	35.7
CNS effects	3	21.4
Black stool	1	7.1
Frequency of use		
Daily	23	18.3
Weekly	21	16.7
Occasionally	43	32.0
Once in a while	42	31.0

GIT: Gastrointestinal tract, CNS: Central nervous system

Table 1: Knowledge and use of dietary supplements

Characteristics	n (%)		
	Yes	No	Not sure
Heard about dietary supplement	259 (96.6)	8 (3.0)	.
Dietary supplement can be used to substitute nutrients from natural food	165 (64.5)	91 (34.0)	.
There are side effects of dietary supplements	37 (13.8)	94 (35.1)	129 (48.1)
Taken dietary supplement before	233 (86.9)	34 (12.7)	.
Taken dietary supplement in the last 12 months	134 (50.0)	126 (47.0)	.
Do you think dietary supplement should be encouraged	226 (84.3)	42 (15.7)	.

supplements occasionally or once in a while but few of them use dietary supplement daily or weekly, similar results have been reported in other studies.^[11,19,22] The reasons given by these students were majorly for good health (58.9%), poor diet (35.0%), to boost immunity (34.3%), weight gain (26.1%), energy (26.8%) and compliance to doctor's prescription (16.4%) as reported in some other studies among athletes.^[7,16,25,26] The reasons given by these students who use dietary supplement, shows that they are aware of the nutritional deficiency and consequences of unhealthy eating habits which they experience and they are also

willing to put more effort into maintaining their health and correcting any nutritional deficiency or unhealthy eating as reported by Dickson.^[10] The low percentage of students who use prescription medications or OTC drugs with dietary supplements could indicate low occurrence of adverse drugs reaction in these students and probably that is why only about 10% reported experiencing side-effects. Furthermore, about half of them reported that their doctors are not aware of their dietary supplement use. The major reason given was that they don't think it is necessary for their doctor to know about their dietary supplement use and this implies that in practice doctors, pharmacists and other health care professionals involved with issuing medications to patients should always ask their patients about any use of dietary supplement before prescribing or issuing medications to them.

Table 3: Gender and factors related to dietary supplement use

Factor	Male %	Female %	Total %	P value
Heard about dietary supplement	97.6	96.5	97	0.592
Can be used to substitute natural nutrients	62.6	66.2	64.4	0.552
Dietary supplements have side-effects	13.0	15.3	14.2	0.636
Dietary supplements are very important	47.6	51.4	49.6	0.807
Dietary supplements are not important	14.5	10.9	12.6	
Have taken dietary supplement before	92.0	83.1	87.3	0.029*
Have taken dietary supplement in the past 12 months	48	54.7	51.5	0.275
Occasional users	30.4	35.6	33.3	0.468
Once a while users	28.6	35.6	32.6	
Take dietary supplement with prescription drugs	29.8	32.0	31.1	0.789
Take dietary supplement with OTC drugs	17.5	22.7	20.5	0.470
Doctor aware of use of dietary supplement	50.9	49.3	50.0	0.623
Do you experience side-effect from dietary supplement use	12.3	9.6	10.8	0.861

OTC: Over-the-counter. *Statistically significant

The students who experienced side effects when taking dietary supplement reported that they experience side-effects like bulimia, GIT effects like nausea, vomiting, diarrhea, constipation, CNS effects like headache, dizziness and black stool. Most of them experienced similar side-effects which can be attributed to the similar supplements used by them. This also shows that dietary supplements do have side-effects.

Conclusion

Majority of the students have heard of dietary supplement. Most of the students have used dietary supplements before but about half of them have used them in the past 12 months. Most of them were occasional users or once in a while users.

Most of the students' doctors were not aware of their dietary supplement use and the students lack full and precise information concerning the side-effects of dietary supplement.

Table 4: Department and factors related to dietary supplement use

Factor	Medicine	Pharmacy	Dentistry	Pharmacology	Physiotherapy	Physiology	Radiography	Total	P value
Heard about dietary supplement	98.6	95.8	94.4	95.8	96.0	100	100	97.0	0.779
Can be used to substitute natural nutrients	65.7	47.8	83.3	63.6	70.8	50.0	86.4	64.5	0.002*
Dietary supplements have side-effects	16.2	17.6	8.6	13.0	4.0	27.8	8.7	14.2	0.134
Dietary supplements are very important	42.0	56.5	38.9	56.5	58.3	66.7	39.1	49.6	0.059
Dietary supplements are not important	11.6	10.1	25.0	4.3	8.3	22.2	8.7	12.6	
Have taken dietary supplement before	95.7	91.5	86.1	87.5	80.0	72.2	69.6	87.3	0.009*
Have taken dietary supplement in the past 12 months	56.5	58.2	36.1	60.9	56.0	35.3	39.1	51.5	0.146
Occasional users	32.4	44.7	40.0	14.3	35.7	0	30.0	33.3	0.587
Once a while users	27.0	34.2	30.0	42.9	35.7	33.3	30.0	32.6	
Take dietary supplement with prescription drugs	18.9	38.5	30.8	14.3	57.1	20.0	40.0	31.1	0.105
Take dietary supplement with OTC drugs	13.5	35.0	8.3	7.1	35.7	20.0	0	20.5	0.036*
Doctor aware of use of dietary supplement	56.8	47.5	61.5	30.8	35.7	40.0	70.0	50.0	0.387
Do you experience side-effect from dietary supplement use	18.9	2.6	23.1	15.4	0	0	11.1	10.8	0.128

OTC: Over-the-counter. *Significant The values are in percentages except for P value

It is recommended that health care practitioners should endeavor to ask their patients about dietary supplement use in order to maximize health care services rendered to the patients and minimize side-effects or adverse drug reactions experienced by patients.

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