
Prevalence, Clinical and Socio-Demographic Profiles of Dietary Supplements Users in a Tertiary Hospital in Uyo, South – South Nigeria

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Abstract: Introduction: Dietary Supplements are one of the most easy to access complementary therapies. Their popularity is related to increasing public awareness about health and health related issues. The objective of this study was to describe the prevalence, clinical and socio-demographic profiles of dietary supplements users among outpatient clinic attendees in the University of Uyo Teaching Hospital, a tertiary health institution in Uyo, South-South Nigeria. Method: This was a prospective descriptive cross-sectional study, involving 573 respondents carried out between September 2014 and February 2015. Using a systematic sampling technique, respondents aged between 18 and 69 years were recruited, data were collected with a structured self-administered questionnaire. Result: Of the 573 respondents recruited into the study, 62.2% (n=356) used dietary supplements; made up of 19.2% (n = 110) males and 43.0% (n =246) females. Dietary supplements use were more prevalent among respondents with post-secondary school education, 24.1% (n = 138), married 19.5%, (n=112), as well as those in the high level income group, 26.4% (n = 151). Herbs were the most preferred dietary supplements among respondents in this study accounting for 23.0% (n = 132). The reported major source of information about dietary supplements among respondents in this study was health care professionals 28.1% (n = 100). There was a statistically significant relationship between dietary supplements use and the presence of hypertension (p = 0.001); Diabetes mellitus (p = 0.002) and osteoarthritis (p = 0.004) among respondents in this study. Conclusion: Findings from this study show that dietary supplements are a ready source of complementary therapy. There is therefore a compelling need to regulate its standard and quality. Communication between patients and physicians is important so as to avoid any adverse effects associated with the concomitant use of dietary supplements and orthodox medicines.

Keywords: Dietary Supplements, Tertiary Hospital, Uyo, South-South Nigeria

1. Introduction

Dietary supplements are one of the most easy to access complementary therapies. Their use is on the increase among people of various ages and socioeconomic background. Numerous definitions and nomenclature for dietary supplements exist worldwide. Such definitions and nomenclature include Natural Health Product in Canada, Food for Special Health Use (FOSHU) in Japan, Biologically Active Food Supplements in Russia, Complementary Medicine in Australia, Food Supplements in European Union and Foods for Special Dietary Use in India¹.

However, In the United States of America (USA), the Dietary Supplements Health Education Act (DSHEA) of 1994 defines a dietary supplement as a product (other than

tobacco) taken by mouth that is intended to supplement the diet which bears or contains one or more of the following dietary ingredients: a vitamin, a mineral, a herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total daily intake or concentrate, metabolite, constituent extract or combinations of these ingredients.^{2,3} According to the DSHEA act, dietary supplements include the following: Vitamins: These include Vitamins A, D, E, C, B6, B12, Thiamin, riboflavin, niacin, folate, biotin, pantothenic acid; Minerals: Calcium, Iron, Zinc, magnesium, manganese, selenium, copper, chromium, iodine; Herbs or other botanicals: Garlic, ginkgo, chamomile, dandelion, milk thistle, capsicum, valerian, yohimbe,

guarana; Amino acids: 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 and melatonin; Concentrates, metabolites, constituents, or combinations: Allicin (from garlic), ginkgo, ginsenosides, bilberry extract, chamomile tea³.

The popularity of dietary supplements may be related to increasing public awareness about health and health-related issues⁴. Dietary supplements were previously used as a nutritional supplement because malnutrition was a major health issue. However, dietary supplements are now used not only as nutritional supplement but also in the prevention and treatment of diseases. For example, herbs and dietary supplements are reported to have significant physiological effects, fish oil supplementation is also reported to have a mild beneficial effect on hypertension.⁵ A previous study in Japan reported that 60% of rheumatoid arthritis patients used dietary supplements of which 40% are components of cartilage that contain chondroitin.⁶

Information about dietary supplements are readily available through radio, television adverts, magazines and newspapers as well as from books, public and formal lectures.⁷

Dangers, however, exist regarding non-regulated use of dietary supplements. These include failure of supplements users to disclose such information to their health care providers as well as failure of physicians to communicate effectively with their clients about use of alternative or complementary therapies. Undisclosed combination of dietary supplements with standard medical therapy may create harm in various ways including overconsumption, harm resulting from rapid absorption in a short period of time. Other dangers include quality issues such as contamination, adulteration or adverse reactions with other foods. Report from National and Nutrition examination survey shows that dietary supplements use among United States adult population has increased from 42% between 1988 and 1994 to 53% between 2003 and 2006.⁸

Another report from South Africa shows that 81.3% of those sampled used dietary supplements and 79.1% of these were regular users.⁹

The reported prevalence of dietary supplement use among college students in Lagos, south-west Nigeria was 50%.¹⁰

In Akwa Ibom State, however, published reports on dietary supplements use as well as the clinical profiles of users are scarce in the scientific literature.

The aim of this study therefore, is to describe the prevalence, socio-demographic as well as the clinical profiles of dietary supplements users among adult Family Medicine outpatient clinic attendees at the University of Uyo Teaching Hospital (UUTH).

Findings from this study will add to the existing pool of knowledge in this regard and will assist healthcare providers to understand the scope of dietary supplements use among patients.

2. Materials, Subjects and Methods

This study was carried out in the family medicine outpatient clinic of the University of Uyo Teaching Hospital (UUTH). UUTH is located in the outskirts of Uyo, the capital of Akwa Ibom State of Nigeria.

Nigeria is divided into six geo political zones as follows: North East, North West, North-Central, South-West, South-East and South-South. Uyo, the capital of Akwa Ibom state is located in the South –South geo-political zone which is often referred to as the Niger Delta Region of Nigeria.

UUTH is currently the only tertiary and referral health institution in the state and currently serves a population of 3.9 million people.¹¹

2.1. Subjects

A total of 573 consenting adult male and female subjects aged between 18 and 69 years attending the Family Medicine Outpatient Clinic took part in the study.

Sample size for this study was calculated using $n = z^2 pq/d^2$ ¹², where 'n' is the desired sample size, 'z' represents standard normal deviation set at 95% confidence level which corresponds to 1.96, 'p' is the prevalence of dietary supplements use quoted in this study¹⁰, 'd' is precision which at 95% confidence interval is 5%

The calculated sample size was 384. Two Thousand Seven Hundred (2700) respondents were sampled during the study period. They were recruited using a systematic sampling method with a sampling interval of seven.

Numbers ranging from one to seven were assigned to the first seven subjects who met the inclusion criteria which included consent to participate in the study, ages not below 18 years or above 69 years. The exclusion criteria included patients who were too sick to be recruited or those with emergency medical condition. The first respondent was chosen by simple balloting, at which one of the numbers from a basket containing the assigned numbers was selected. Subsequently every 7th subject was recruited into the study. Where, however, such a respondent was below 18 years or above 69 years of age, the respondent was dropped. Then the next respondent that met the inclusion criteria was recruited.

Ethical approval for this study was obtained from the UUTH Health Research and Ethical Committee. A pre-test of the research proforma was performed to determine its applicability, experience and logistic problems.

2.2. Methods

This was a prospective descriptive cross-sectional study conducted between September 2014 and February 2015. Five hundred and seventy-three respondents aged between 18 and 69 years were recruited after obtaining informed consent from them. A structured and pre-tested self-administered questionnaire was used to obtain information about socio-demographic profiles of the respondents.

The level of income of the respondents was determined using the Nigerian National Minimum wage act passed by the Nigeria Parliament¹³.

The act stipulates a maximum basic monthly salary of sixty thousand naira for lower income earners between salary grade levels 01 and 07, middle level income earners range from salary grade levels 08 to 15, with a maximum basic monthly income of sixty-five thousand naira only, while high level income earners range from salary grade levels 16 to 17 with a maximum basic monthly income of two hundred and ninety-five thousand naira only. Currently two hundred naira exchanges for one American dollar.

The questionnaire also elicited information about types of dietary supplements as defined by the DSHEA act³, as well as respondents' sources of information about dietary supplements.

Clinical conditions of respondents were assessed using standard guidelines. Hypertension was diagnosed based on the Joint National Committee on Prevention, detection, evaluation and treatment of high blood pressure (BP) criteria which uses an average BP of >140/90 mmHg after two readings.¹⁴

Diabetes mellitus was diagnosed based on the 2011 revised criteria by the expert committee on the diagnosis and classification of diabetes mellitus which recommended the diagnosis of diabetes mellitus based on two fasting plasma glucose (2FPG) levels of 126 mg/dl (7.0 mmol/l) or higher or 2 hours post-prandial glucose load of 75g or higher or two casual glucose readings of 200mg/dl (11.1 mmol/l) or higher or glycosylated haemoglobin of >6.4%.¹⁵

Osteoarthritis was diagnosed based on the American College of family Physicians diagnostic criteria of joint pain and stiffness of insidious onset occurring in a middle-aged or elderly person involving the knee, hip, hand or spine.¹⁶

2.3. Data Analysis

Statistical analysis was done using the statistical package for social sciences (SPSS) version 17.0. Distribution and cross tabulation were generated, chi-square was used to compare proportions. The p-value of 0.05 was used to determine the level of statistical significance.

3. Results

Five hundred and seventy three (573) respondents were recruited into the study. Of these, 36.8% (n = 211) were males while 63.2% (n = 362) were females.

Table 1 shows the socio-demographic characteristics of the respondents. A total of 19.2% (n=110) male respondents used dietary supplements while the number of female respondents who used dietary supplements was 43.0% (n=246).

A total of 41.2% (n=236) respondents within the age bracket of 45 years and above used dietary supplements in this study.

The overall prevalence of dietary supplements use among respondents in this study was 62.2%.

Respondents who attained post-secondary school education also constituted the highest number of dietary supplements users in this study accounting for 24.1% (n=138).

Moreover, married respondents 31.5% (n = 112) as well as

respondents that belong to the high level income group 26.4% (n = 151) consumed more dietary supplements.

Table 2 shows the frequency and types of dietary supplements used by respondents in this study. A total of 20.2% (n = 72) respondents used vitamins, 9.6% (n = 34) respondents used minerals, 2.5% (n = 9) respondents used amino acids, 37.1% (n = 132) respondents used herbs and other botanicals, while 25.0% (n= 89) respondents used concentrates.

Table 3 shows the sources of information about dietary supplements among respondent in this study. Health care workers, 28.1% (n =100) constituted the largest sources of information about dietary supplements among respondents in this study.

The media, 14.3% (n = 51) as well as family and friends 11.2% (n =40) were other sources of information about dietary supplements in this study.

Information about dietary supplements were also reportedly sourced from books by some 7.0% (n =25) respondents in this study.

Table 4 shows the clinical characteristics of respondents who participated in this study as they were evaluated in the family medicine outpatient clinic. Of the 22.3% (n = 128) respondents in this study who were being treated for hypertension, 16.4% (n = 94) used dietary supplements while 5.9% (n = 34) did not.

A total of 26.2% (n = 150) respondents who participated in the study were being treated for diabetes mellitus. Of these, 18.0% (n = 103) used dietary supplements, while 8.2% (n = 47) did not. A total of 7.9% (n = 45) respondents whose diagnosis were not classified after medical evaluation used dietary supplements while 13.4% (n=77) did not. One hundred and twenty eight (30.8%) respondents were on anti-hypertensive medication. Of these, 22.2% (n=79) respondents also used dietary supplements while 8.6% (n=49) did not.

Of the 20.4% (n=117) respondents who were on steroid medication, 13.1% (n = 75) used dietary supplements while 7.3% (n = 42) respondents did not use any form of dietary supplements.

Table 1. Socio-demographic characteristics of respondents using or not using dietary supplements.

Variable	dietary supplements		p-value
	users (n = 356 [%])	non users (n = 217 [%])	
Sex			
Male	110 [19.2]	101 [17.6]	0.001*
Female	246 [43.0]	116 [20.2]	
Age in years			
18 – 24	23 [4.0]	25 [4.4]	
25 – 34	46 [8.0]	38 [6.6]	
35 – 44	51 [8.9]	52 [9.1]	0.001*
45 – 54	66 [11.5]	33 [5.8]	
55 – 64	78 [13.6]	37 [7.0]	
65 -69	92 [16.1]	32 [5.6]	
Educational level			
No formal education	72 [12.6]	52 [9.1]	
Primary school	36 [6.3]	49 [8.6]	0.001*
Secondary school	110 [19.2]	62 [10.8]	

Variable	dietary supplements		p-value
	users (n = 356 [%])	non users (n = 217 [%])	
Post sec. School	138 [24.1]	54 [9.4]	
Marital status			
Single	111 [19.4]	37[6.5]	
Married	112 [19.5]	75 [13.1]	
Co-habiting	84 [14.7]	59 [10.3]	0.001*
Divorced/separated	49 [8.6]	46 [8.0]	
Income			
Low level	81 [14.1]	104 [18.2]	
Middle level	124 [21.6]	66 [11.5]	0.001*
High level	151 [26.4]	47 [8.2]	

* Statistically significant

Table 2. Frequency and types of dietary supplements used by respondents.

variable	frequency	percentage [%]
vitamins	72	20.2
minerals	34	9.6
amino acids	9	2.5
herbs	132	37.1
supplements	20	5.6
concentrates	89	25.0
total	356	100

Table 3. Sources of information about dietary supplements among respondents.

Variable	frequency	percentage [%]
Health-care professionals (physicians, pharmacists, dietitians)	100	28.1
Media	51	14.3
Food and supplement labels	41	11.5
Nutrition specialty stores	31	8.7
Food and supplement labels	40	11.2
Internet	28	7.9
Family and friends	40	11.2
Books	25	7.0
Total	356	100.0

Table 4. Clinical characteristics of respondents using or not using dietary supplements.

Variable	dietary supplements		p-value
	users (n = 356[%])	non users (n = 217[%])	
Hypertension	94 [16.4]	34 [5.9]	0.001*
Diabetes mellitus	103 [18.0]	47 [8.2]	0.002 *
Osteoarthritis	114 [19.9]	59 [10.3]	0.004*
Unclassified ailments	45 [7.9]	77 [13.4]	0.047*
Medication history			
Anti-hypertensive drug	79 [22.2]	49 [8.6]	0.001*
Anti-diabetic drugs	102 [17.8]	48 [8.4]	0.003*
Anti-hypertensive/anti-diabetic drugs	100 [17.5]	78 [13.6]	0.264
Steroids	75 [13.1]	42 [7.3]	0.043*

* Statistically significant

4. Discussion

The overall prevalence of dietary supplements use in this study was 62.2% made up of 19.2% males and 43.0% females. This was higher than the reported prevalence of dietary supplements use among final year medical students in

Lagos, South-West, Nigeria which was 50%¹⁰.

In another study, the reported prevalence of dietary supplements use among African-American men and women was 49% and 66% respectively ¹⁷. The differences in prevalence rates may be due to such factors as methodology used as well as the population studied.

The popularity of dietary supplements among female respondents in this study, however, may be attributed to ease of accessibility since no prescriptions are required and laws regulating the sales and distribution of supplements are not strictly enforced.¹⁸

A prevalence rate of 16.1% of dietary supplements use was recorded among respondents aged between 65 and 69 years of age, and among 24.1% of respondents with post-secondary school education as well as 26.4% of those who belonged to the high income wage bracket.

Several epidemiological studies have correlated dietary supplements use with people of higher socio-economic status, health conscious and affluent disposition as well as the highly educated ^{9, 19, 20}. Similar demographic characteristics were seen in this study. The reason for this might be related to lifestyle factors as well as increased health consciousness among the highly educated and the rich. Higher socio-economic status has been linked to better lifestyle choices and better educated people are more likely to have lifestyles that are physically and emotionally less stressful.

The most frequently used supplements among respondents in this study were herbs accounting for 37.1%. This was different from a report involving final year medical students in Lagos South-West Nigeria, in which vitamins were the most frequently used supplements.¹⁰ High prevalence of vitamins use have also been reported in other studies.^{18,20}

The reason for the above disparity might be due to ease of access of vitamins by the students coupled with the fact that vitamins may not be very expensive to buy whereas respondents in this study may have had unrestricted access to all forms of supplements including herbs.

Moreover, herbs are popular among Nigerians because of its low cost, easy availability, the naturalness of its source as well as the belief that most illnesses are caused by supernatural factors.²¹

A total of 30.9% of the respondents indicated that they got their information about dietary supplements from health care professionals (physicians, pharmacists and dietitians). This was followed by the media (17.1%), family and friends (14.1%) as well as food and supplement labels (11.5%).

In a study involving final year medical students in Lagos, South-West Nigeria, the reported sources of information about dietary supplements included schools (63%), multimedia (41%), doctors (34%) and parents (22%).¹⁰

It is worrisome to note that the media encourage consumers to use dietary supplements without restraint since laws regulating the advertisement of supplements through these channels are not effectively enforced. This state of affairs should not be ignored as these pose great dangers to public health. Increased efforts, including public enlightenment, aimed at improving public understanding

about the possible dangers of unrestrained use of dietary supplements is hereby advocated.

Most respondents with various medical conditions used dietary supplements in this study. These include hypertension, diabetes mellitus, osteoarthritis as well as some unclassified ailments. This is similar to report from other workers.^{5, 6, 22} Respondents on various medications also used dietary supplements in this study.

This is particularly dangerous because of the danger that could arise from the combination of orthodox medicine and dietary supplements.

Consequently, health care providers should be familiar with the most common supplements especially herbs because of their potential for adverse effects and major supplements-to-drugs interactions.

5. Conclusion

In conclusion, findings from this study show that the use of dietary supplement is common among family medicine outpatient clinic attendees in the University of Uyo Teaching Hospital (UUTH). Evidence also show concomitant use of dietary supplements and orthodox medicine among respondents. In view of the above, there is a compelling need for honest communication between patients and physicians to avoid any adverse effects that might result from the combination of dietary supplements and orthodox medicine.

The limitation of this study is that respondents included only clinic outpatients as such the results may not be generalized to the general population. Further studies on the scope of dietary supplements use as well as the analysis, composition and labelling of the various supplements groups are hereby advocated.

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