

Dietary Supplements: Knowledge and Usage Opinions among Health Sciences Students

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ABSTRACT: Adequate diet and nutrition plays a key role in the maintenance of good health and the prevention of disease. Dietary 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. Millions of people around the world have decided to use DS in their daily life.

KEYWORDS: Dietary supplements, Health Science, Knowledge

I. INTRODUCTION

Adequate diet and nutrition plays a key role in the maintenance of good health and the prevention of disease. The balanced diet aims at providing essential nutrients to the body. The DS has vital role in diet.⁽¹⁾ DS are defined as the product that intends to add nutritional value to the diet. The different supplements used includes multivitamins, multiminerals, amino acids, and individual vitamin and mineral supplements such as vitamin A, B complex, C, magnesium and zinc.⁽²⁾ Peoples use dietary supplements for a broader range of reasons, which depends on their age, sex, physical activity or health status but mainly for overall health and wellness, illness prevention and correction of the dietary deficiencies are indicated.⁽⁴⁾ DS represent an important source of essential nutrients, and millions of people around the world have decided to use DS in their daily life.⁽³⁾

In 1994 The Dietary Supplement Health and Education Act (DSHEA), approved by the USA Food and Drug administration(FDA) defines, DS includes a wide array of non-food, non-drug substances intended to supplement the diet, but are

not intended to treat diseases or disorders of the human body. According to DSHEA, these products contains one or more dietary ingredients such as a vitamin, mineral, herb or other botanical, amino acid, concentrate, metabolite or combination of ingredients. They may be purchased without a prescription and a federal regulation of these products differs significantly from that of food or drugs.⁽⁵⁾

Recently, due to the spread of the corona virus disease 2019 (COVID-19) pandemic in 2020, a new reason for DS use has emerged. In media, more and more advertisements of DS that are thought to help in the treatment and prevention of COVID-19 can be found. Although, the scientific evidence on immune boosting, anti-inflammatory, antioxidant, and antiviral properties of several bioactive compounds exists, actually the guidelines for the treatment of COVID-19 do not comment on the use of DS.⁽⁶⁾

Consumers of supplements use a variety of sources to gain knowledge about dietary supplements and to make their decisions to use these products, mostly without knowing the credibility and reliability of the information. These sources include family, friends, media (television, magazines, newspapers, and internet), doctors, pharmacists, nurses, and nutritionists.⁽⁷⁾

One of the alarming fact is that a considerable number of people consuming the DS do not seek any medical advice before taking them. According to the current regulations, DS are considered as dietary products and therefore they are available not only in pharmacies, but also in other places, such as groceries or online stores etc. Vast number of people does not tell the difference between medication and DS, Frequently administering different groups of preparations at the same time neglecting possible interactions

between the substances contained in them also not known.⁽⁸⁾

Scientists and health professionals agree that dietary supplements can be under certain conditions beneficial to human health but should not replace complete and balanced daily meals of food substances. The market for dietary supplements taken to improve the health or well-being of the customer is enormous. However, these products are not necessarily safe for everybody.

Like regular drugs, supplements with active ingredients that provide a physiological or pharmacological effect are likely to cause adverse effects also in susceptible individuals. More attention to adverse effects and potential interactions is needed to avoid serious medical outcomes. Users and physicians alike should consult updated literature before beginning or advising a regimen involving these substances. Medical providers should be aware that a large fraction of the general population takes dietary supplements. They should therefore request information from patients about their supplement intake to provide optimal medical care. Self-prescription of dietary supplements should be avoided and patients, older people, pregnant women, young persons and people living with disabilities should be informed and advised by their doctors or pharmacists on dietary supplementation.⁽⁹⁾

Healthcare providers including Practitioners, Pharmacists, Nurses and all Health Sciences Students (HSSs) can widely influence the public's belief and practices regarding health and medicines, and they can advise individuals regarding the usage of DS and the effects of those supplements on health. Since it is believed that the health behavior of HSSs will be reflected in their attitude while counseling patients regarding diet and nutrition, it is important to collect data regarding the knowledge and usage opinions of dietary supplements among the students.⁽¹⁰⁾

II. MATERIALS AND METHODS

STUDY DESIGN: This was a questionnaire based Prospective Observational study.

STUDY SUBJECT: College students in Chitradurga who meet the following criteria:

Inclusion criteria:

- Health Sciences [Medical, Dental, Nursing, Pharmacy] students of Chitradurga
- Both male and female students of 18 to 30 years

- Both hostellers and day scholars

Exclusion Criteria;

- All the drop out students

STUDY SITE: This study was conducted among college students belong to Health Science courses of SJM Vidyapeetha, Chitradurga.

STUDY PERIOD: Study was conducted for a period of six months.

ETHICAL APPROVAL: The study was approved by the Institutional Ethical Committee of SJM College of Pharmacy, Chitradurga.

- Vide number: SJMCP/686/2021-22.

SOURCES OF DATA: Data was collected using questionnaire based online survey among Health sciences students in Chitradurga.

STUDY INSTRUMENT: A structured self-administered questionnaire was developed after a thorough literature review on knowledge, opinions and practices regarding the usage of dietary supplements. Questionnaire was divided into four sections with a total of 32 questions

- Section A: Socio-demographic data
- Section B: Knowledge based questions on dietary supplements
- Section C: Opinion about dietary supplements
- Section D: Practice based questions

SAMPLE SIZE: A total of 302 students studying Medical, Dental, Nursing and Pharmacy course were requested to fill the questionnaires after they are agreeing to the informed consent form.

Statistical Evaluation of Data: All the relevant data was entered in Microsoft excel and was analyzed by using Statistical Package for Social Services [SPSS 16.0] software. Categorical data was analyzed by frequency distribution method and quantitative data was analyzed by central tendency distribution and by measures of dispersion.

DURATION OF THE STUDY: Study was conducted for a period of six months.

ETHICAL ISSUES: Information obtained from respondents was held in strict confidence; Consent was sought from the students before being given the questionnaire.

III. RESULTS

A total number of 302 responses were recorded, where the questionnaire was designed to assess the knowledge, attitude and practices o using Dietary Supplements among the health sciences students of chitradurga. The objectives of the study were to assess the knowledge, opinions and usage

practices associated with the use of DS among students.

3.1 Age wise Distribution

Out of 302 study participants, Majority of the respondents (48.7 %) belonged to the age group of 22-25 years. The results were graphically represented in Figure no 1.

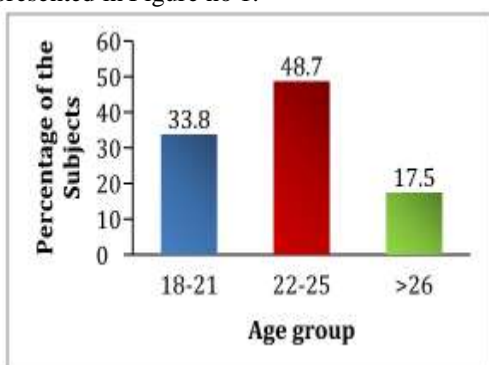


Figure no.1. Details of Age Group Distribution

3.2 Gender wise Distribution

Out of 302 study participants, 45.4% (N=137) of them were males while 54.6% (N=165) were females. The results were graphically represented in Figure no 2.

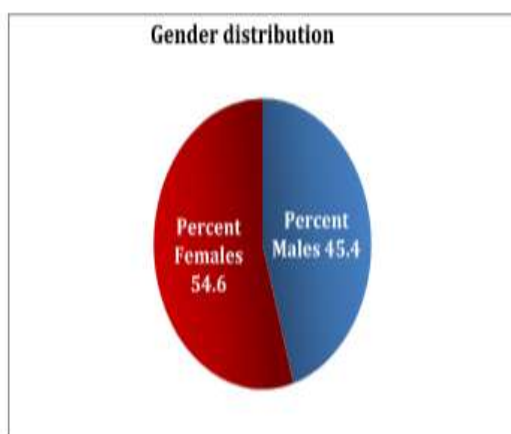


Figure no.2. Details of Gender Distribution

3.3 Course wise distribution

Out of 302 study participants, 19.5% (N=59) dental students, 18.2% (N=55) were medical students, 23.9% (N=72) nursing students, 38.4% (N=116) pharmacy students. The results were graphically represented in Figure no 3.

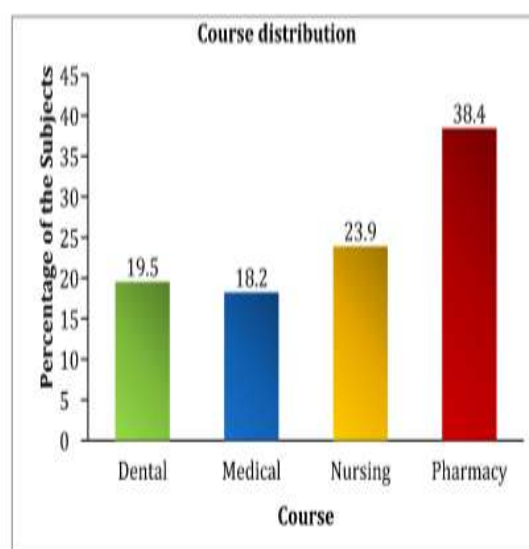


Figure no .3. Details Of Course wise distribution

3.4 Questionnaire Assessment

3.4.1 Knowledge Based Questions

To assess the knowledge of the study participants about DS a self-administered questionnaire containing 13 questions were given. Total 302 responses were recorded. The questions were depleted in Table no 1.

Table no 1: Questionnaire used to determine knowledge of study participants regarding Dietary Supplements				
Serial no.	Questions	True	False	Don't know
1	Dietary supplements is a product that is intended to supplement the diet			
2	Dietary supplements should be used to reduce the risk of vitamin and mineral			

	deficiencies?			
3	Both iron overload and iron deficiency results in alterations in immune responses of humans			
4	Vitamin D deficiency produces Rickets			
5	Zinc is one the most important nutrient after to fight against the novel coronavirus disease			
6	Vitamin A deficiency produces scurvy			
7	Taking excessive amounts of magnesium supplements can cause diarrhoea and nausea			
8	Dairy products and fish are deficient in iodine			
9	High doses of zinc sulphate (2mg/day or more) can cause gastrointestinal irritation and vomiting			
10	Pantothenic acid deficiency causes leg cramps, paraesthesia and insomnia			
11	A diet low in calcium increases the risk of osteoporosis in elderly			
12	Women taking oral contraceptives agents have an increased risk of developing riboflavin deficiency			
13	Despite their Popularity, the health benefits of Dietary supplements are questionable			

3.4.1.1 Knowledge Assessment

Distribution of mean scores of knowledge assessment (Total Score is 13).

The mean scores were analysed using suitable statistical parameters like mean, standard deviation and one sample T test. Medical students

are having high knowledge about dietary supplements (≈ 9.13). Sequence of the knowledge among health sciences students is as follows Medical > Pharmacy > Dental > Nursing. The results are shown in Table No: 2A and 2B followed by graphically represented in Figure no 4.

Table No 2A: Distribution of mean scores of knowledge assessment among health science courses

Course	N	Mean	Std. Deviation	Std. Error Mean
Dental	59	7.9322	3.58091	.46619
Nursing	72	7.1273	3.45904	.46642
Pharmacy	116	8.0694	2.23497	.26339
Medical	55	9.1293	2.35365	.21853

**Table No 2B: Distribution of mean scores of knowledge assessment among health science courses
Test used: ONE SAMPLE T TEST (Sig: 0.000)**

One-Sample Test						
Course	Test Value = 0				95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Dental	17.015	58	.000	7.93220	6.9990	8.8654

Nursing	15.281	71	.000	7.12727	6.1922	8.0624
Pharmacy	30.636	115	.000	8.06944	7.5443	8.5946
Medical	41.776	54	.000	9.12931	8.6964	9.5622

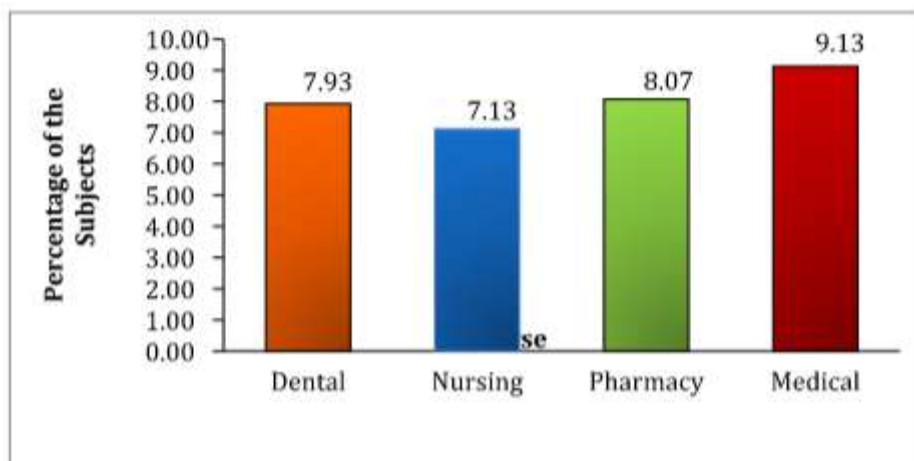


Figure no.4. Scores of Knowledge Based Assessment

3.4.2 Attitude Based questions

To assess the attitude of the study participants regarding the Dietary Supplements usage a self-designed questionnaire containing 8 questions were given and the responses were recorded.

The respondents' were asked that, whether they considered that dietary supplements were necessary for all ages, whether The amount of dietary supplements we get from food is enough for good health, whether Dietary supplements are completely safe, Whether Regular use of dietary supplements can prevent occurrence of chronic diseases, Whether the regular use of dietary supplements prevent cancers, Whether the Overdosing of Dietary supplements can cause toxic effects, Whether is it important to inform physicians about Dietary supplements use and whether health personnel should promote the use of supplements. The respondents had three options to express their opinions namely, 'Agree', 'Disagree' and 'Not sure'. The responses were generally between 'Agree' and 'Not sure'. The results were shown in Table no.3. according to the opinions of study population associated with the Dietary Supplements use.

3.4.3 Practice Based Questions

To assess participants practice regarding the usage of dietary supplements a self-designed

questionnaire containing 9 questions were given and the responses were recorded.

The study reported that more than half of the study participants (53.3%) were using DS. 24.8% were using them daily, remaining were using occasionally or 3 to 4 times a week. The supplements most commonly used were multivitamin and mineral supplements, followed by vitamin B complex, protein supplements, herbal products and antioxidants. The commonest reasons for consuming dietary supplements were to maintain good health followed by to strengthen immunity, to increase muscle mass and for weight reduction. Most of the students using DS with doctor or the dietician's recommendation followed by internet, TV ads and family/friends. Around 19.2% of the students reported that they continuously take dietary supplements for more than three months without medical advice. Among DS users only 3.9% of the participants had experienced side effects attributed to DS use, 5.6% of the participants answered that they had side effects but not sure that is because of DS use and 43.7% of them reported no side effects with DS use. In the present study around 74.8% of the students are planning to buy the dietary supplements in future. The results were shown in Table no.4.

Table no.3. Opinions associated with the Dietary Supplements use

Notation	Questions Asked	Response received (N=302)					
		Agree		Disagree		Not sure	
		N	(%)	N	(%)	N	(%)
•	DS are necessary for all ages	212	70.2	52	17.2	38	12.6
•	The amount of DS we get from food is enough for good health	161	53.3	88	29.1	53	17.5
•	DS are completely safe	126	41.7	97	32.1	79	26.2
•	Regular use of DS can prevent chronic diseases	122	40.4	85	28.1	95	31.5
•	DS can prevent cancers	100	33.1	108	35.8	94	31.1
•	Overdosing of DS can cause toxic effects	184	60.9	41	13.6	77	25.5
•	It is important to inform physicians about DS use	223	73.8	30	9.9	49	16.2
•	Health care personal should promote the use of DS	184	60.9	36	11.9	82	27.2

DS- Dietary Supplements

Table no.4. Factors associated with the use of DS use

Parameters	N	%
• Do you consume DS?		
• No	141	46.6
• Yes	161	53.3
• How frequently you consume the DS?		
• Daily	75	24.8
• Occasionally	35	11.5
• 3-4 times a week	51	16.8
• Not applicable	141	46.6
• Why do you take DS?		
• To maintain good health	59	19.5
• To strengthen immunity	43	14.2
• To increase the muscle mass/Weight gain	32	10.5
• For Weight reduction	27	8.9
• Not applicable	141	46.6
• What kind of DS you consumed/consuming?		
• Multi vitamin and mineral supplements	74	24.5
• Antioxidants	12	3.97

• Vitamin B Complex	11	3.6
• Protein supplements	38	12.5
• Herbal products	26	8.6
• Not applicable	141	46.6
Who advised you to use the DS?		
• Doctor/Dietician	62	20.5
• Internet/websites/social media sites	34	11.2
• Myself	17	5.6
• Pharmacist	9	2.9
• Family/Friends	18	5.9
• TV ads	22	7.2
• Not applicable	141	46.6
Do you continuously take dietary supplements for more than three months without medical advice?		
• No	58	19.2
• Yes	37	12.2
• Sometimes	66	21.8
• Not applicable	141	46.6
Experience with DS use		
• Had side effects attributable to DS use	12	3.9
• Had side effects but not sure because of DS	17	5.6
• No side effects	132	43.7
• Not applicable	141	46.6
Have you noticed benefits from taking DS?		
• No	56	18.5
• Yes	155	51.3
• Not applicable	141	46.6
Will you buy DS in future?		
• No	21	6.95
• Yes	140	46.35

IV. DISCUSSION

Health care professionals play an enormous role in moulding the public opinions and beliefs regarding the health related issues and hence the health sciences students should be well informed about nutrition and its role in maintaining the health with this background the study was conducted.

In order to determine the knowledge of study participants about DS, the mean scores for students in each group was determined course wise and gender wise and then compared. Medical students were having high knowledge (≈ 9.13) then compared to Pharmacy, Dental and Nursing students and female students had better knowledge than compared to men similar findings were reported in the study conducted by Sharma et al.,⁽¹⁾

When we asked opinion that “Dietary supplements are necessary for all ages”, among 302 participants 68.8% of them answered ‘Agree’, 19.2% of them answered ‘Disagree’, and 11.9% of them answered ‘Not sure’ to the given statement, similar results have been reported in the study conducted by Sharma et al., When we asked that “Regular use of DS prevents chronic diseases” among 302 students 40.5% health sciences students were answered ‘Agree’ to this question. So these findings were in line with a study conducted by Zezelj SP et al.,⁽³⁾

The use of dietary supplements is increasingly growing because they are readily available. Among 302 Medical, Dental, Nursing and Pharmacy students participated in the survey about 53.3% were consuming dietary supplements and 24.8% were reported using them daily.

Similarly in the study conducted by Teng CL et al.,⁽¹¹⁾ in which 43.4% of the study population reported that they are using DS daily. Among the study participants 47.6% of them reported that they are not consuming DS, These findings are quite similar to the study conducted Steele M et al.,⁽¹²⁾

The most common justification among the students in this study to indulge in the use of DS were to maintain good health 19.5% and about 25.5% of the students are consuming multi vitamin and mineral supplements. Similarly the study conducted by Naggar AL et al.,⁽¹³⁾ 80% of the students consumed DS to maintain good health and 30.5% of the students have reported of consuming multivitamins.

When we asked regarding sources of information that the students obtained to use the dietary supplements, 20.5% of them answered doctor/dietician this may be due to the medical nature of the students of health sciences courses. Similar results were reported in the study conducted by Alhomoud FK et al.,⁽¹⁰⁾ Among DS users, only 3.9% of the participants reported that they had side effects attributable to Dietary supplements use. Whereas in the study conducted by Samreen S et al.,⁽¹⁴⁾ 8.2% of the participants suffered from side effects, this indicates lack of full and precise knowledge about dietary supplements because dietary supplements do have side effects. When we asked about experience that “Have you noticed benefits from taking DS”, among the total 51.3% of them answered ‘Yes’, 30.1% of them answered ‘Sometimes’ and 18.5% of them answered ‘No’. Our results are in line with the study conducted by Althamini JZ et al.,⁽¹⁵⁾

V. CONCLUSION

The study concluded that:

- The Medical students had better level of knowledge (≈ 9.15) than compared to other HSSs included in the study.
- The overall student’s opinions associated with the dietary supplements use were generally between ‘Agree’ and ‘not sure’ so this shows many of students do not know the accurate information about the benefits and risks related to DS use.
- More than half of the study participants (53.3%) were using DS and 24.8% were using them daily. Among the DS users, multi vitamin and mineral supplements are most commonly used. And the most common reasons for using the DS were to maintain good health followed by to strengthen immunity, to increase the muscle

mass/weight gain and for weight reduction. Around 3.9% of the participants had experienced side effects attributed to DS use, 5.6% of the participants answered that they had side effects but not sure that is because of DS use and 43.7% of them reported no side effects with DS use. Among the study participants around 74.8% of them are planning to buy the dietary supplements in future.

- Our study highlights the increasing trend of DS use among HSSs in Chitradurga. More importantly, many of them do not have accurate information about dietary supplements, therefore there is a need to provide education to the students and access to scientific and unbiased information regarding all aspects related to the DS. The present results could serve as support for faculties of health science courses to improve their curriculum to encourage better and safer use of DS and to support the development of messages aimed to safely use DS. Therefore, we advocate the implementation of educational programs that teach students how to use DSs to avoid their complications and achieve the optimum therapeutic benefits.

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