

A Cross-Sectional Study on Consumption of Dietary Supplements and Health Status among College going Students

Priyanshi Garg¹ and Gita Bisla²

Faculty of Home Science, Banasthali Vidyapith, Rajasthan

Abstract

The study was undertaken as a cross-sectional consumption analysis of dietary supplements and health status among college-going students. Dietary supplements are additional nutrients to diet in form of one or multiple vitamins, minerals, amino acid, fibre or any functional nutrient. The objective of the study is to compare the health status of college students who consume and don't consume dietary supplements. The sample selection of the study was done by Purposive Sampling. Numbers of subjects were 60. Subjects were divided in two groups (30+30). Data was collected from samples. This study was conducted in Rajasthan. Data collection was carried out through structured questionnaires created in Google form. In this study 4 statistical tools were used that are mean, standard deviation, variables and Student's t-test. There were 21 males and 39 females, selected from different parts of Rajasthan. The age group of all samples lied between 18 - 24 years, while the mean age was found as 21.5 years (S.D. 3.53). When the t-test applied, statistically significant difference was found between two groups. In the results that group A which is consuming supplements showed better health status than who are not consuming. As for the consumption 60% of them were consuming protein powders for strength and muscle building, 20% for multivitamins to fulfil their nutrient requirements and few were taking revival to boost their immunity. Knowledge level of the group A was less than the group B as they were unaware about the meaning and health benefits of dietary supplements. Subjects who do not consume Dietary Supplements, not much in the favor taking them as they in their opinion it cannot be consumed on daily basis also most of them preferred balanced diet to overcome nutrient deficiencies.

Keywords

Dietary Supplements, Dietary Supplement Health and Education Act (DSHEA), Protein Powders, Multivitamins, Mineral Supplements & Calcium Supplements

Introduction

According to the Dietary Supplement Health and Education Act (DSHEA) Product that contains one or more than one dietary substance such as vitamin, mineral, herb, botanical, amino acid and used to supplement the diet which increases the nutrient intake known as Dietary Supplements (Federal Food, Drug, and Cosmetic Act, 2013). It contains ingredients that are intended to be ingested in the form of pills, capsules, tablets, or liquids; and it is marketed as a dietary supplement. (Ronis et al., 2018) There has been an increase in dietary supplement use among the younger population in recent years. Worldwide, dietary supplements are ingestible products that are distinct from conventional foods and medications (Valavanidis et al., 2016). In well-nourished individuals, there does not appear to be a scientific consensus about the effects of vitamins or other dietary supplements on health (Moyer et al., 2014) Many people lack a basic understanding of nutrition, which leads them to consume unbalanced diets that are high in calories, fats and minerals while low in protein and vitamins (Kourkouta et al., 2016). Long-term exposure to this environment has led to multiple degenerative diseases. Supplemental nutrition was

proposed to address this issue in an effort to solve it. (Oikonomou et al., 2009) There are several types of supplements, but protein powders, multivitamins, mineral supplements, and calcium supplements are the most used (Bailey et al., 2013).

Objectives

- To study dietary supplements consumption pattern among college going students
- To examine the attitudes and behaviours of students towards dietary supplements
- To assess knowledge level about dietary supplements from those who do not consume any dietary supplements
- Some sort of comparison among the health status of college students who consume and don't consume dietary supplements

Research Methodology

Study Design

The study design was Cross-sectional comparative study. It was an observational research that analysed data of variables collected at one given point in time across a sample population or a pre-defined subset.

Sample Selection

The sample selection of the study was done by Purposive Sampling technique because the participants were chosen on the basis of purpose of the study.

Sample Size

Number of subjects were 60.

Subjects were divided in two groups (30 + 30):

- Group A refers to subjects who do not consume Dietary supplements
- Group B refers to the subjects who are consuming Dietary supplements

Eligibility Criteria

Inclusion criteria

- College goers in the age range of 18-25 years
- Tech savvy having access to Internet
- Both males and females who were willing to participate
- For Group B those who consume dietary supplements

Exclusion Criteria

- College goers who have been recently hospitalized
- Those suffering from non-communicable disease
- Those who are above or below age group of 18-25 years

Data collection

Data was collected from sample students

This study was conducted in Rajasthan

Tools & Techniques

Data collection was carried out through structured questionnaires created in Google form. Questionnaires provide a quantitative method of data gathering. The questionnaire was self-administered and divided into modules:

Background Information

In this questionnaire, basic information about the subjects were asked: Name, age, gender, mobile number, email address, family income, occupation of father, occupation of mother, city, highest degree or level of education, employed, most preferred video conferencing app.

Health Status

Structured questionnaire were prepared for both groups (N=30+30) and asked about their physical and psychological well-being.

Knowledge towards dietary supplements for those who do not consume them.

Consumption of dietary supplements

In this questionnaire subjects asked about their consumption, brands, time duration, pricing, etc.

Statistical Analysis

In this study 4 statistical tools were used that are mean, standard deviation, variables and Student's t-test. After collecting the data from the subjects, the data was analyzed by using mean and standard deviation and variable. Mean $\pm$ SD was calculated for girls and boys separately and then the whole sample selection. N and N% was also calculated.

The arithmetic mean was calculated that is the central value of a discrete set of digits: The standard deviation is a statistic tool that measures the dispersion from the mean.

A variable in the mathematical sense, that is a quantity which may take any one of specified set of values.

Student's t-test was applied to find out any statistically significant difference between the experimental and control group.

Results & Discussion

The study was conducted to assess the consumption of dietary supplements by students and to examine the attitudes and behaviours of students and to assess knowledge level about dietary supplements from those who do not consume them and also to compare the health status of college students who consume and don't consume dietary supplements. The sample size of the study was 60 and subjects were divided in two groups for comparison. There were 21 males and 39 females, selected from different parts of Rajasthan. The age group of all samples lied between 18-24 years, while the mean age was 21.5 years with a standard deviation of 3.53. This study involves different education level students, in which 71.6% of students were undergraduate, 25% were postgraduate and 3.3% were pursuing graduation. In total only 26.6% of them were engaged in part-time occupation.

S. No.	Parameter	Number	%
1	Age (in years)		
a.	Male	21	35
b.	Female	39	65
2	Family Income (annual)		
a.	Below 2 Lakhs	12	20
b.	2-5 Lakhs	18	30
c.	5-7 Lakhs	16	26.6
d.	Above 7 Lakhs	14	23.3
3	Education		
a.	Undergraduate	43	71.6
b.	Graduate	2	3.3
c.	Postgraduate	15	25
d.	Doctorate	0	0
4	Part-Time Occupation		
a.	Yes	16	26.6
b.	No	44	73.3
5	Monthly Expenditure		
a.	Less than 10,000	29	48.3
b.	10,000-15,000	18	30
c.	15,000-20,000	3	5
d.	More than 20,000	10	16.6
6	Preferential mode of Communication		
a.	WhatsApp Call	21	35
b.	Google Meet	4	6.6
c.	Zoom	2	3.3
d.	Audio Call	33	55

Table 1: Background Information of all the subjects

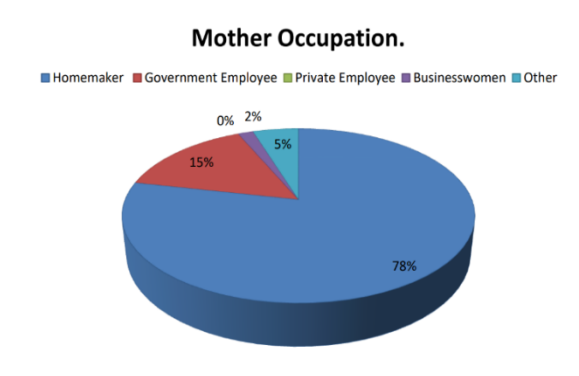


Figure 1: Mother's Occupation of the subjects

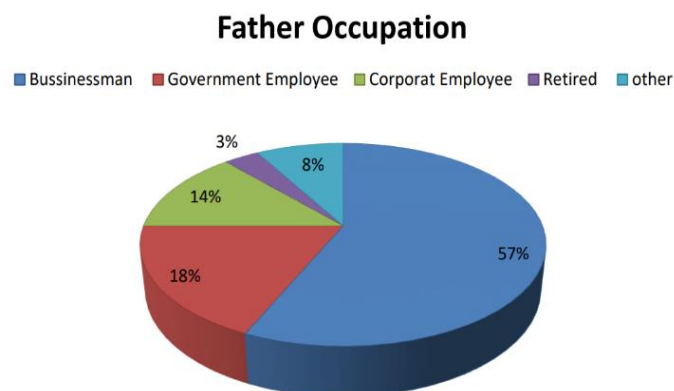


Figure 2: Father's Occupation of the subjects

The purpose of the study was to find out the overall well being of the students with all dimensions of health including mental, physical and psychological health. It gives us opportunity to take proactive stance timely for a better health. There were some questions asked to assess health status of subjects and 50% of them were having headache, 17% were having fever & fatigue and 3% faced other symptoms in a month. When asked about their sleep disturbances subjects replied 43% rarely, 40 % Never and 17% occasionally. 63% of subject's skip meals.

S. No.	Questions	Males 7 (23%)	Females 23 (77%)	Total 30 (100%)
1	Faced any kind of these symptoms in a month			
a.	Fever	1(14)	4(17)	5(17)
b.	Headache	4(58)	11(48)	15(50)
c.	Fatigue	1(14)	4(17)	5(17)
d.	Other	0	1(5)	1(3)
e.	None	1(14)	3(13)	4(13)
2	Feeling any sleep disturbances			
a.	Occasionally	1(14)	4(17)	5(17)
b.	Rarely	2(29)	11(48)	13(43)
c.	Never	4(58)	8(35)	12(40)
3	Feeling of anxiety or stress			
a.	Always	1(14)	3(13)	4(13)
b.	Occasionally	3(43)	10(43)	13(43)
c.	Rarely	2(29)	5(22)	7(23)
d.	Never	1(14)	5(22)	6(21)
4	Meals do you consume in a day			
a.	Two	3(43)	6(26)	9(30)
b.	Three	1(14)	12(52)	13(43)
c.	Four	2(28)	4(17)	6(21)
d.	Five	1(14)	1(5)	2(6)
5	Meals skip			
a.	Yes	5(71)	14(61)	19(63)
b.	No	2(29)	9(39)	11(37)
6	Exercise on a daily basis			
a.	Yes	5(71)	7(30)	11(37)
b.	No	2(29)	16(70)	18(60)

Table 2: Health Status Of The Subjects Who Do Not Consume Dietary Supplements

To assess the behaviour and attitudes of the subjects some questions were asked from the subjects related to dietary supplements. 60% did not know about supplements only 37% of subjects know about supplements also 60% did not think they are good for you and 40% did not think that it's good for them and also they prefer 96% of subjects prefer balanced diet to overcome nutrient deficiencies.

S. No.	Questions	Males 7 (23%)	Females 23 (77%)	Total 30 (100%)
1	Do they know about Dietary supplements?			
a.	Yes	3(42)	9(39)	11(37)
b.	No	4(58)	14(61)	18(60)
2	Do you think dietary supplements are good for you?			
a.	Yes	1(14)	12(52)	12(40)
b.	No	6(86)	11(48)	18(60)
3	Can dietary supplements consume on daily basis?			
a.	Yes	6(86)	7(30)	13(43)
b.	No	1(14)	16(69)	17(57)

Table 3: Attitude and behaviours towards Dietary Supplements

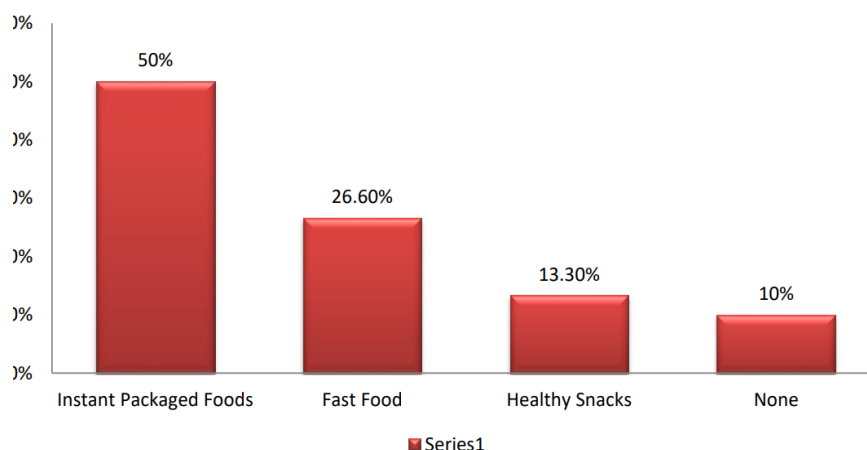


Figure 3: Subject's Evening snacks food preferences

To compare health status, we also assessed the status who consume dietary supplements as shown in below table that 73% of them exercise on regular basis also 67% of them do not skip their meals and majority of them were rarely having anxiety and stress.

No. of Subjects	N %	Interpretation
14	46	Poor
10	33	Good
6	20	Excellent

Table 4: Knowledge level of subjects

As we assessed the knowledge level of subjects who do not consume dietary supplements and as shown in the table that 46% were falling in the poor category as they don't know the meaning and health benefits, 33% were answered some questions so they were in the good category and only 20% of the population were in the excellent category.

Consumption of Dietary Supplements

■ Protein Powder ■ Multivitamin Tablets ■ Revital ■ Other

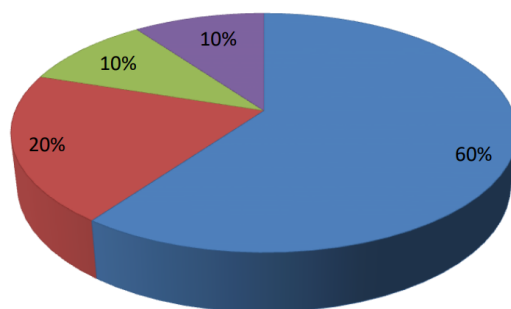


Figure 4: Dietary Supplements Consumption

S. No.	Questions	Males 14 (47%)	Females 16 (53%)	Total 30 (100%)
1	Faced any kind of these symptoms in a month			
a.	Fever	1(7)	3(18)	4(14)
b.	Headache	5(35)	8(50)	13(43)
c.	Fatigue	1(7)	3(18)	4(14)
d.	Other	1(7)	1(7)	2(6)
e.	None	6(43)	1(7)	7(23)
2	Feeling any sleep disturbances			
a.	Occasionally	1(7)	2(12)	3(10)
b.	Rarely	10(71)	13(81)	23(76)
c.	Never	3(21)	1(7)	4(14)
3	Feeling of anxiety or stress			
a.	Always	1(7)	3(18)	4(14)
b.	Occasionally	1(7)	4(25)	5(16)
c.	Rarely	9(64)	8(50)	17(57)
d.	Never	3(22)	1(7)	4(13)

4	Meals do you consume in a day			
a.	Two	1(7)	3(18)	4(14)
b.	Three	3(22)	3(18)	6(20)
c.	Four	9(64)	8(50)	17(57)
d.	Five	1(7)	2(12)	3(10)
5	Meals skip			
a.	Yes	3(22)	7(44)	10(33)
b.	No	11(78)	9(56)	20(67)
6	Exercise on a daily basis			
a.	Yes	13(93)	9(56)	22(73)
b.	No	1(7)	7(44)	8(27)
7	Opinion about dietary supplements			
a.	Good	13(93)	15(94)	28(93)
b.	Bad	1(7)	1(7)	2(7)
8	Doses in a day			
a.	One	9(64)	11(69)	20(67)
b.	Two	5(36)	5(31)	10(33)

Table 5: Health Status of subjects who consume Dietary Supplements

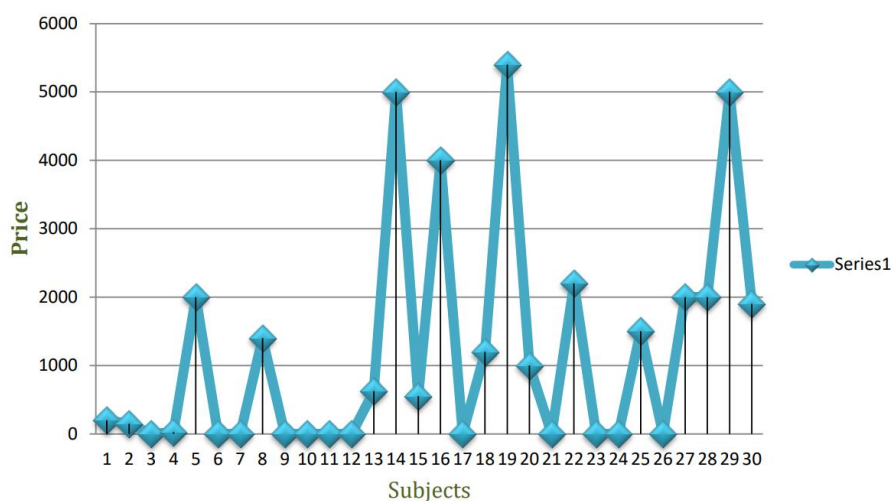


Figure 5: Pricing of Dietary Supplements

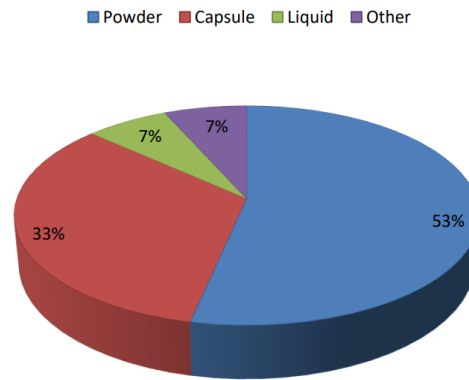


Figure 6: Form of Dietary Supplements being consumed

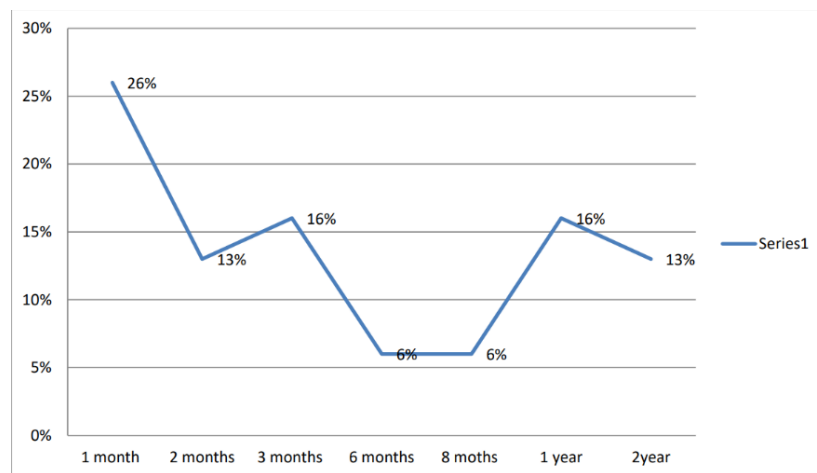


Figure 7: Time duration from which the Subjects are taking Supplements

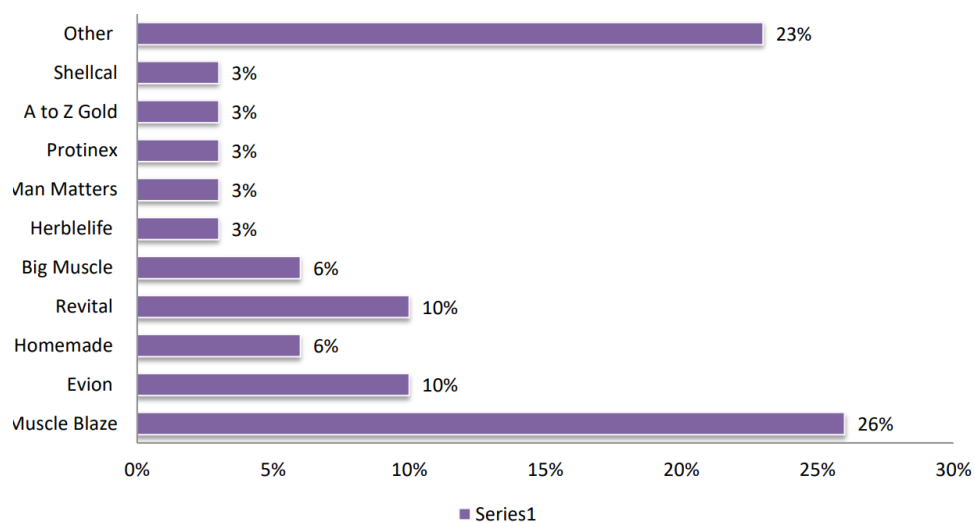


Figure 8: Popular Brands consumed

No. of Subjects	N%	Interpretation
2	6	Poor
6	20	Good
22	73	Excellent

Table 6: Knowledge level of subjects who are consuming Dietary Supplements

As we assessed the knowledge level of subjects who do consume dietary supplements and as seen in the table that most of the falling in the excellent category and only 6% were in poor category.

S. No.	Questions	Mean		SD	Mean difference
		Group A* (n=30)	Group B* (n=30)		
1	Faced any kind of these symptoms in a month	26.8	24.4	1.2	2.4
2	Feeling any sleep disturbances	22	27.3	2.7	5.3
3	Feeling of anxiety or stress	25.5	27	0.8	1.5
4	Meals do you consume in a day	28.5	27.7	0.4	0.8
5	Meals skip	24.5	25	0.3	0.5
6	Exercise on daily basis	20	26	3	6

Table 7: Comparison between Health Status Group A And Group B

*Group A refers to subjects who do not consume Dietary supplements

Group B refers to the subjects who are consuming

Dietary supplements t-test: $t=1.94$, $p=0.16$, $DF= 58$.

Similar question was asked to compare the health status of Group A and Group B about their monthly symptoms, sleep disturbances, stress, meals they consume, do they skip meals, etc. then we calculate the mean difference and it is shown in the table.

A statistically significant difference was found between the two groups and null hypothesis was rejected.

Conclusion

Dietary supplements are nutraceutical products that provide one or more nutrients at a time and are consumed in addition to diet to overcome any nutrient deficiency in form of powder, tablet, capsule, gel or any other function food like herbs and seasonings. The study was conducted to assess the consumption of dietary supplements by students and to examine the attitudes and behaviors of students and to assess knowledge level about dietary supplements from those who do not consume them and also to compare the health status of college students who consume and don't consume dietary supplements. The sample size of the study was 60 and subjects were divided in two groups for comparison. This was comparative study on consumption of dietary supplements and health status among College-going students as we have seen in the results that group A which is consuming supplements has better health status than who are not consuming. As for the

consumption 60% of them were consuming protein powders for strength and muscle building, 20% for multivitamins to fulfill their nutrient requirements and few are taking revival to boost their immunity.

Knowledge level of the group A is less than the group B as they were unaware about the meaning and health benefits of dietary supplements. Subjects who do not consume Dietary Supplements, not much in the favor taking them as they in their opinion it cannot be consume on daily basis also most of them were preferred balanced diet to overcome nutrient deficiencies.

Future implications of theis research work can be done in form of long-term studies on knowledge, attitude and practices about dietary supplements among all ages groups, sexes including all regions of India.

References

Bailey RL, Gahche JJ, Miller PE, Thomas PR, Dwyer JT (2013) Why US adults use dietary supplements. JAMA Intern Med 173(5):355–361

Federal Food, Drug, and Cosmetic Act, 2018. US Food & Drug Administration (FD&C Act)

Kourkouta L, Iliadis C, Frantzana E, Monios A, Dimitriadou A, Papathanassiou IV (2016) Health and dietary supplements. Int J Eng Appl Sci 3(9):2394–3661

Moyer MW (2014) Vitamins of trial. Nature 510:462–464

Oikonomou ND (2009) The effect of supplementation of antioxidants vitamins C and E in antioxidant capacity of young men. Department of Physical Education and SportsScience. University of Thessaly

Ronis MJ, Pedersen KB, Watt J. Adverse effects of nutraceuticals and dietary supplements. Annu rev pharmacol toxicol, 2018; 58:583–601. doi: [10.1146/annurev-pharmtox-010617-052844](https://doi.org/10.1146/annurev-pharmtox-010617-052844)

Statistical Methods. 43rd Edition (By S.P. Gupta)

Valavanidis A. Dietary supplements: Beneficial to human health or just peace of mind? A critical review on the issue of benefit/ risk of dietary supplements. Pharmakeftiki, 2016; 28(2):69-92.