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# Dietary supplements use among gym goers in India

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**ABSTRACT**

**Objective:**
This study is about to explore the dietary supplements use among gym going population in Bangalore city India.

**Methodology**

**Study Design**

A descriptive cross sectional survey was designed

**Study setting**

The research study was carried out among gym goers in Bangalore city, India for a period of 3 months (April-June 2018)

**Study population and sampling technique**

The study population was the gym goers in Bangalore irrespective of ethnicity, age groups, and background.

**Study instrument**

A structured self administered questionnaire was designed based on previous literature which includes close ended and open ended questionnaires were used for this study. The study instrument was divided into three sections: (a) Demographic characteristics, includes gender, age, occupation, education and family income; (b) life style characteristics; personal health, chronic health disease, smoking habits and physical activity ; (c) usage of dietary supplements.

The questionnaire was prepared in Google form and shared to the respondents through (whatsapp) group with the help of acquaintance. The group contains different age groups from different background. The group was active since 2 years where people are sharing nutritional inputs, workout plans etc. Total 164 members were in group out of that only 112 are responded.

**Statistical analysis**

Data were analyzed by using the IBM SPSS Statistics 20 Software, 2009 (SPSS Inc., Chicago, IL, USA). Descriptive statistics in terms of frequencies and percentages were used Pearson chi-square test was used to study the associations among dependent and independent variables. Statistical significance was set at $p<.05$

**Results:**

Of 112 participants 93.8% were male and 6.3% were female, No one has reported of chronic disease, (18.8%) respondents are feel that they are suffering with chronic disease. Among 112 (37.5%) are considered themselves in good health condition. There were no stastcial differences between user and non user group in association with gender, age, occupation and income. Education is the only variable which has the statically significance between the groups ($p<0.005$)

## 1. Introduction

According to the report produced by ASSOCHAM in association with RNCOS a business consultancy, India is witness for the growth of dietary supplement market. In 2015, the value of nutraceuticals industry is US$ 1.8 Billion. By 2022, they are expected to reach US$5.2 Billion(RNCOS 2016). According to Dietary supplement health education act “any products (other than tobacco) intend to supplement the required diet that contains more than one dietary nutrient ingredient are considered as dietary supplements. The reasons for the expansion of DS market are, people are more health conscious, regulation discrepancies, and marketers have the ease access for the different kind of supplements which is supported by dynamic advertising practices.

These are the considered as complementary alternative medicine than conventional medicine. The reason for growth of dietary supplements is raise in Non communicable disease. According to World health organization report (WHO , 2014), largely four types of NCDs (cardiovascular diseases, respiratory diseases ,cancer & diabetes are contribute 61% deaths in India. Behavioral Risk factors related with these diseases are two types i.e. modifiable risk factors (unhealthy

dietary patterns , physical inactivity, consumption of alcohol and smoking) and non adjustable factors includes gender , heredity and age .

The study conducted by WHO on physical inactivity documented that more than 35% people are physically inactive. The ratio is 1:2 between men and women. Women were 50%

The highest prevalence of supplement users is expected to be in gyms. Gym goers and trainees present a major target group for the dietary supplements(Khoury, 2012) marketing because the penetration of different products with multiple combinations and health claims. The uses of dietary supplements are increased dramatically (Khoury, 2012; Lacerda et al 2015; M, Isabel,et al 2010).However, there is limited literature reporting the prevalence and reasons warranting DS use among gym goers in India. The study was conducted in among gym going population in the city of Bangalore to assess the use of dietary supplement intake.

## 2. Methodology

### *Study Design*

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## 3. Results

insufficiently active where as men's constitute 25% (Guthold, Stevens, Riley, & Bull, 2018). Diet and physical activity are parallel and inter connected factors which plays major role in every one's life. Dietary supplements are used for different intentions such as increase our immunity levels, muscle building, prevent diseases and provide sufficient nutrients to the body which are lacking in normal diet.

***Demographic information:***

Of 112 participants 93.8% were male and 6.3% were female. Majority of the participants were (60%) in the age group of 20-25. According to their occupation; Student represent (51.8%), Employee (21.4%), Business (20.5%), Farmer (4.5%), Housewife (1.8%). Most of the participants were undergraduates. And 54.5% respondents reported that their income is not enough for them. (Table 1) shows the detailed results.

**Table 1 Demographic data of participants (112)**

| Demographics | Number (112) | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Male` | 105 | 93.8 |
| Female | 07 | 6.3 |
| **Age** | | |
| <25 | 60 | 53.6 |
| 26-30 | 37 | 33.0 |
| >30 | 15 | 13.4 |
| **Occupation** | | |
| Student | 58 | 51.8 |
| Employee | 54 | 21.4 |
| Business | 23 | 20.5 |
| Farmer | 5 | 4.5 |
| Housewife | 2 | 1.8 |
| **Education** | | |
| Secondary school | 7 | 6.3 |
| Bachelor degree | 65 | 55.4 |
| Post graduate | 35 | 31.3 |
| Scholar | 8 | 7.1 |
| **Income** | | |
| Not enough | 61 | 54.5 |
| Just enough | 37 | 33 |
| Enough and saving | 14 | 12.5 |

***Life style characteristics:***

No one has reported of chronic disease, (18.8%) respondents are feel that they are suffering with chronic disease. Among 112 (37.5%) are considered themselves having good health, (26.8%) were very good and rest of them were fairly good. Majority of them were non smokers (85.7%) and not following any diet regimen. 43% participants were engaged in physical activity more than 6 months and with the frequency of 3 times /week.

**Table 2 Health & life style characteristics of participants**

| Health & Life style characteristics | Number N (112) | Percentage (%) |
|---|---|---|
| **Personal health** | | |
| Poor | 3 | 2.7 |
| Fair | 10 | 8.9 |

| | | |
|---|---|---|
| Good | 42 | 37.5 |
| Very good | 30 | 26.8 |
| Excellent | 27 | 24.1 |
| **Suffer any chronic disease** | | |
| No | 91 | 81.3 |
| May be | 21 | 18.8 |
| **Smoking habit** | | |
| Never | 96 | 85.7 |
| Current | 10 | 8.9 |
| Former | 6 | 5.4 |
| **Consider my self** | | |
| Underweight | 16 | 14.3 |
| Healthy weight | 58 | 51.8 |
| Overweight | 15 | 13.4 |
| Obese | 13 | 11.6 |
| I don't know | 10 | 8.9 |
| **Special diet regimen** | | |
| Not following | 46 | 41.1 |
| Other special diet | 29 | 25.9 |
| For body building | 8 | 7.1 |
| For weight management | 29 | 25.9 |
| **Engaging physical activity** | | |
| <1 month | 42 | 37.5 |
| 1-6 months | 27 | 24.1 |
| >6 months | 43 | 38.4 |
| **Physical activity for a week** | | |
| <1time/week | 31 | 27.7 |
| 1-3times/week | 36 | 32.1 |
| >3times/week | 45 | 40.2 |

***Association of Health & life style variables with usage of dietary supplements by gym goers***

**Table 3** depicts the association Of DS use with health & life style characteristics. Among the participants, there was no significant differences between user and non user group in association with smoke, diet following and physical activity. On the other side, DS user group include more health conscious, majority of them were not suffering with chronic disease, and 39% are healthy weight compared with non user group. The differences between these groups are statically significant ($p<0.05$).

**Table 3 Association between dietary supplements use and l life style characteristics**

| Health & Life style characteristics | Supplements use | | Percentage (%) | P value |
|---|---|---|---|---|
| | DS Non Users | DS Users | | |
| **Personal health** | | | | |
| Poor | 1(2.2%) | 2(3%) | 3(2.7%) | |
| Fair | 6(13.3%) | 4(6%) | 10(8.9%) | |
| Good | 27(60%) | 15(22.4%) | 42(37.5%) | **.000*** |
| Very good | 10(22.%) | 20(29.%) | 30(26.%) | |
| Excellent | 1(2.2%) | 26(38.3%) | 27(24.1%) | |
| **Suffer any chronic disease** | | | | |
| No | 28(62. 2%) | 63(94%) | 91(81.2%) | **.000*** |
| May be | 17(37.8%) | 4(6%) | 21(18.8%) | |
| **Smoking habit** | | | | |
| Never | 38(84.4%) | 58(86.6%) | 96(85.7%) | |
| Current | 5(11.1%) | 5(7.5%) | 10(8.9%) | .766 |
| Former | 2(4.4%) | 4(6%) | 6(5.4%) | |
| **Consider my self** | | | | |
| Underweight | 3(6.7%) | 13(19.4%) | 16(14.3%) | |
| Healthy weight | 19(42.2%) | 39(58.2%) | 58(51.8%) | |
| Overweight | 10(22.2%) | 5(1.5%) | 15(13.4%) | **.010*** |
| Obese | 9(20%) | 4(6%) | 13(11.6%) | |
| I don't know | 4(8.9%) | 6(9%) | 10(8.9%) | |
| **Special diet regimen** | | | | |
| Not following | 16(35.6%) | 30(44.8%) | 46(41.1%) | |
| Other special diet | 15(33.3%) | 14(20.9%) | 29(25.9%) | .399 |
| For body building | 2(4.4%) | 6(9%) | 8(7.1%) | |
| For weight management | 12(26.7%) | 17(25.4%) | 29(25.9%) | |
| **Engaging physical activity** | | | | |
| <1 month | 22(48.9%) | 20(29.9%) | 42(37.5%) | |
| 1-6 months | 11(24.4%) | 16(23.9%) | 27(24.1%) | .958 |
| >6 months | 12(26.7%) | 31(46.3%) | 43(38.4%) | |
| **Physical activity for a week** | | | | |
| <1time/week | 17(37.8%) | 14(20.9%) | 31(27.7%) | |
| 1-3times/week | 15(33.3%) | 21(31.3%) | 36(32.1%) | .075 |
| >3times/week | 13(28.9%) | 32(47.8%) | 45(4.2%) | |

***Type of supplements and frequency of use according to gender and age group***

**Table 4 Type of DS and frequency of use according to gender and age group**

| Supplement use | | | | | |
|---|---|---|---|---|---|
| **Supplement type[a]** | **Gender** | | **Age** | | |
| | **Male (60)** | **Female (8)** | **<25(40)** | **25-30 (20)** | **>30(8)** |
| **Herbs** | 40(66.6%) | 5(62.5%) | 26(65%) | 13(65%) | 6(75%) |
| **Vitamins/minerals** | 35(58.3%) | 5(62.5%) | 23(57.5%) | 13(65%) | 4(50%) |
| **Probiotics** | 18(30%) | 4(50%) | 15(37.5%) | 6(30%) | 11(2.5%) |
| **Amino acids** | 40(66.6%) | 7(87.5%) | 29(72.5%) | 14(70%) | 4(50%) |
| **Others** | 28(46.6%) | 5(62.5%) | 14(35%) | 1365%) | 6(75%) |
| [a] Multiple responses. | | | | | |

Above table shows that percentages of supplements were used by gym users since one year, it was categorized according to age and gender. we consolidated supplements into five major groups from the existence literature Our results showed that Herbs and amino acids were the most commonly used DS ;66% of (herbs and amino acids ) in males and 62.5% of( herbs), 87% (amino acids) in females , followed by vitamins.

***Association between DS Use and demographic characteristics***

Below table (Table 5) represents the association between supplement use and demographic characteristics. There were no statically differences between user and non user group in association with gender, age, occupation and income. Education is the only factor which has the stastical significance between the groups (p<0.005)

**Table 5 Association between supplement Use and demographic characteristics**

| Demographics | Supplement use | | | |
|---|---|---|---|---|
| | **DS users** | **DS non users** | **Percentage** | **P value** |
| **Gender** | | | | |
| Male` | 59 | 38 | 86.6% | .582 |
| Female | 8 | 7 | 13.4% | |
| **Age** | | | | |
| <25 | 40 | 20 | 53.6% | |
| 26-30 | 19 | 18 | 33% | .281 |
| >30 | 8 | 7 | 13.4% | |
| **Occupation** | | | | |
| Student | 40 | 18 | 51.8 | |
| Employee | 11 | 13 | 21.4% | |
| Business | 12 | 11 | 20.5% | .153 |
| Farmer | 2 | 3 | 4.5% | |
| Housewife | 2 | 0 | 1.8% | |
| **Education** | | | | |
| Secondary school | 1 | 6 | 6.2% | |
| Bachelor degree | 38 | 24 | 55.4% | **.034**** |
| Post graduate | 21 | 14 | 31.2% | |
| Scholar | 7 | 1 | 7.1% | |
| **Income** | | | | |
| Not enough | 36 | 25 | 54.5% | |
| Just enough & saving | 23 | 14 | 33% | .931 |
| Enough & saving | 8 | 6 | 12.5% | |

***Reasons for consuming DS according to gender and age group***

The below Table 6 illustrates about the consumers motives towards using DS with respect to age and gender groups. Majority indicated to promote their health and they felt they were lacking sufficient nutrients to their body. Both gender groups have equally proportionate and majority were (44.1%) age between 20-25 have mentioned that they were lacking needy nutrients to their body so as the reason they were consuming DS followed by health promotion.

**Table 5 Association between supplement Use and demographic characteristics**

**Table 5 Association between supplement Use and demographic characteristics Reasons for consuming DS according to gender and age group**

| Reason for using DS | Gender | | Age | | |
|---|---|---|---|---|---|
| | **Male (60)** | **Female (8)** | **<25(40)** | **25-30 (20)** | **>30(8)** |
| **Promote** | 40(58.8%) | 5(7.4%) | 25(36.8%) | 13(19.1%) | 7(10.3%) |
| **Prevent** | 26(38.2%) | 2(2.9%) | 16(23.5%) | 8(11.8%) | 4(5.9%) |
| **Treat** | 7(10.3%) | 0(0%) | 3(4.4%) | 3(4.4%) | 1(1.5%) |
| **Lack of nutrients** | 40(58.8%) | 5(7.4%) | 30(44.1%) | 12(17.6%) | 3(4.4%) |
| **Energy** | 30(41.1%) | 5(7.4%) | 15(22.1%) | 14(20.6%) | 6(8.8%) |

[a] Multiple responses.

***Source of information:***

Males were more interested to obtain information from gym personnel (43.8%) followed by health professionals (23.2%). Female participants were also informed that they used to obtain information from gym personnel. Young people between 20-25 age group were looking for gym personals for right information on DS, where as 26-30 age group were depended on media (13.4%)

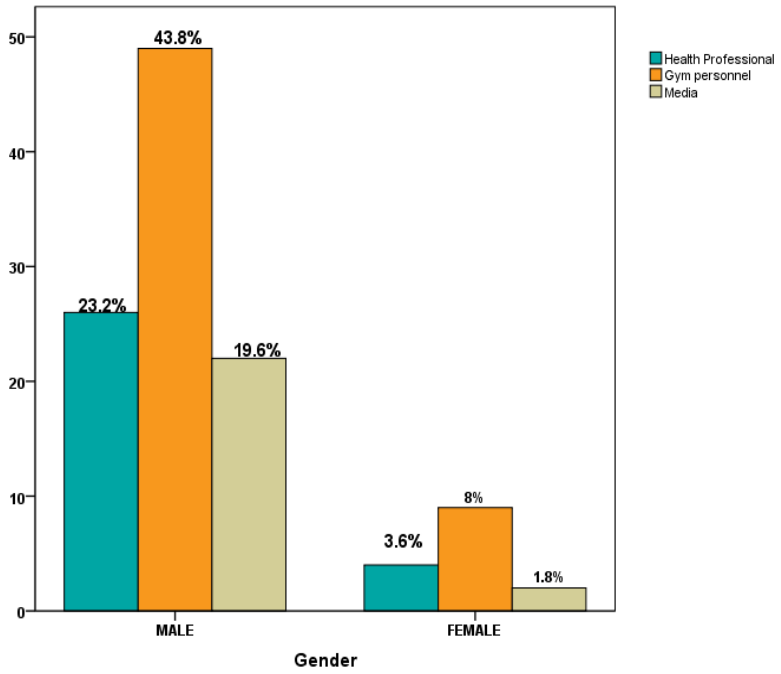


**Figure 1 source of information about DS by gender**

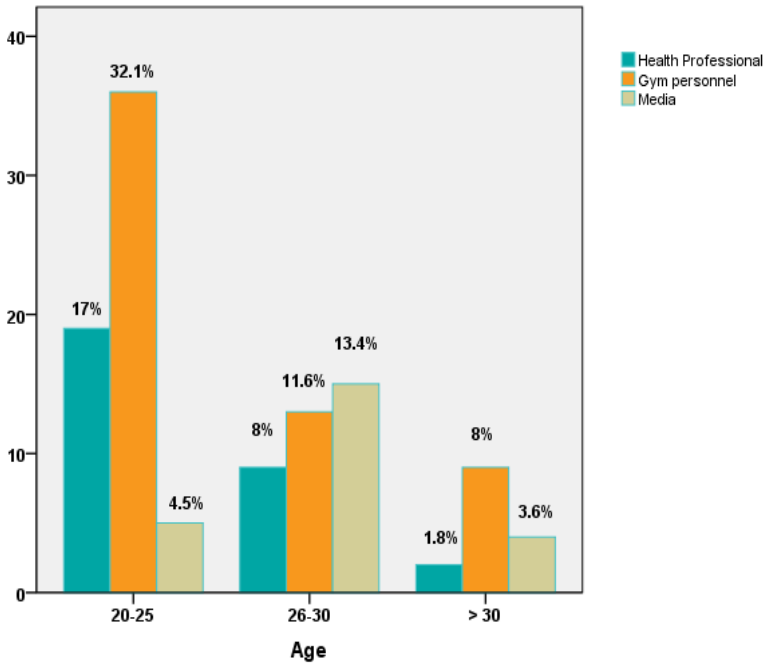


**Figure 2 source of information about DS by Age**

## 4. Discussion

The study is about the prevalence and use of dietary supplements among gym goers in Bangalore city, India. The primary findings of this study illustrate that males respondents are constitute majority of the DS users than women which supports the similar studies (Abo & Elgamal, 2016; Lacerda et al., 2015; Viana et al., 2017) and also contrast with other studies where female participants are majority among DS consumers(Sotoudeh et al., 2015). The present study has low female respondents could be the reason for this finding.

The study investigated most of the DS uses were aged between below 25, our study is in agreement with earlier study(Attlee, Haider, Hassan, Alzamil, & Hashim, 2017) below 24 years age group were consuming more supplements. And majority of the users were graduates. In this study (86.6%) Nonsmokers were consuming DS than current smokers. And 94% of Users were not suffering with any chronic disease and the findings reported that people who were using DS have a good health consistent with the current findings (Lacerda et al., 2015; M et al., 2010) reported similar findings where most of the non smokers were consuming DS and they reported no disease has been found at the time of survey. This may be attributed to Because of sedentary life style people are more focused on preventive care with this result consistent with previous studies young participants were more among total sample who adopted supplement use.

This study measure the association between consumption of DS and life style characteristics shows that health characteristics i.e. personal health and chronic disease had significance relationship than other characteristics. In addition to that those who are not following any kind of special diet were perhaps to use supplements.

On the contrary, people who are considering themselves healthy weight are using supplements. Those who are engaged in physical activities greater than 6 month found to be more likely to use dietary supplements. The present study also Consistent with other studies(Aljaloud & Ibrahim, 2013; Jawadi et al., 2017; Viana et al., 2017)

In association with earlier study (Abo & Elgamal, 2016) this study also revealed that male and youth are adopted use of DS associated with herbs and amino acids. Females and aged above 30 years were certainly to use probiotics and amino acids respectively. Income is the one of the factor which is identified in this study that majority of non users not having enough income for not consuming supplements.

Our study also documented the association of DS use with demographic and life style characteristics. Similar patterns have been observed that those who reported their health was in excellent(M et al., 2010) and not suffering with any kind of chronic disease and also maintain healthy weight are consuming supplements because this may be attributed to maintain good health and conscious about their health by adding these supplements to their diet.

It also focused on consumption of multiple supplements where respondents were asked to answer more than one supplement they were using. And the motives behind supplement use were different among respondents. Similar to our study where Male respondents are tend to use supplements to improve their general health as well as replacing their nutrients which are lacking in their diet, Female participants were also reported the same as males, previous research also has reported similar findings (Abo & Elgamal, 2016) Furthermore participants age between 20-25 years used DS for improve their health and compensating the daily needy nutrients and finally they tend to use to increases their energy levels. Our study results are reported in agreement with similar studies(Sharma, Adiga, & Ashok, 2014, chandrika et al., 2017)

In this study irrespective the use of DS, all participants were asked to state the source of information. Among the three sources gym personnel were considered as most trusted source of information on use of supplements, especially younger male respondents. Many studies are concluded that participants believed their trainees regarding information of supplement use (Article, 2014; Molinero & Márquez, 2009). Media plays crucial role for getting any type of information irrespective of credibility. 21 century is the witness for enormous growth of technology. In this study revealed that participants were interested more towards seeking of information form gym trainees than health care professionals because this may be attributed that due to high consultation fee and sometimes may change their prescription or fear about disapproval by doctor ( Valentine et al., 2017, Joseph et al., 2018;). Due to easy access of information media being a part of every one lives.

## 5. Limitations

The study was conducted among gym goers who were residents of Bangalore city alone and date collected through whatsp group where limited respondents are representing the data.

## 6. Conclusion

The study is about to know the use of DS among gym goers and measure the association of demographic characteristics with supplements and life style characteristics with DS consumption. The study revealed findings which consistent the previous studies and majority of the characteristics are contrary to other studies except health. In India few studies were reported on supplements use, type of supplements and reason for using. But this study has focused on the association between the characteristics.

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