



NUTRITIONAL SUPPLEMENT PRACTICES OF GYM TRAINEES IN A NORTH INDIAN CITY

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ABSTRACT

Background: There is an increasing trend for the use of gym supplements in professional and non-professional gym trainees. The documented data supporting the choice and type of gym supplement is not sufficient. Therefore, the goals of this study was to assess the type and prevalence of supplement use, the frequency of use, and relationships between age, gender and type of training. The study also focusses on the commonly associated adverse effects with the use of supplements.

Participants and Methods: This questionnaire based study was conducted across 3 categories of gym in Lucknow city of Uttar Pradesh, India. Total candidates enrolled in the study were 155, the study questionnaire contained 17 questions divided into three parts: first part of the questionnaire focused on the demographic characteristics of the participants, second part focused on the preference and type of supplements used. The third part of the questionnaire gathered the pharmacovigilance data. Descriptive data were calculated as frequencies (%). Chi-square (χ^2) analysis was used to analyze the correlation between choice of supplement and type of exercise undertaken.

Results: The response rate of the study was 100%. Most of the participants were males (72.2%) and the higher use of supplement was seen in the age group of 18 to 25 years (29%). Whey protein (41.93%) was the most commonly used supplement and there was a positive correlation between whey protein consumption and strength training ($P < 0.05$). Majority of individuals experienced some sort of adverse effects with the use of gym supplements (63.2%). The most commonly encountered adverse effects were related to GI tract mainly abdominal pain and bloating sensation. Small group of individuals also experienced neuro psychological disturbances.

Conclusion: The study concluded that there is an increasing trend for the use of gym supplements mainly by the youngsters belonging to age group of 18 to 25 years which may be due to the direct impact of the fitness industry.

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INTRODUCTION

A dietary supplement is a product consumed for the purpose of supplementing the diet with one or more ingredients including both macronutrients such as amino acids, proteins and fats and micronutrients such as vitamins, minerals and herbs.^[1] Commercially nutritional supplements are classified as bodybuilding supplements, weight loss agents, energy and performance boosters. The high demand of nutritional supplements in athletes has given birth to a blooming multibillion dollar industry, dietary supplements market in India is currently estimated at about \$2 billion and is likely to almost double by 2020 in order to meet the growing needs of the athletes which is a matter of pharmacoeconomical concern^[2]

The use of these nutritional supplements in athletes has become widespread especially in the teenage group with the aim to gain muscle mass, endurance and to enhance performance, prevention of nutritional deficiencies, better physical appearance, immune system enhancement, and recovery from training and injury. According to a survey

conducted by the Assocham Social Development Foundation across top Indian cities about 78 per cent adolescents in urban India daily consumed dietary supplements in one or the other form^[3]

However there is only a little scientific evidence proving its pharmacological utility but marks a higher risk of adverse effects and dependence liability.

Most of the supplement manufacturing companies provide high claims in terms of utility but fail to highlight its adverse effect. Various studies have demonstrated an increased risk of cardiovascular, hematological and dermatological side effects associated with the use of dietary supplements^[4]. It has been highlighted that around 10 to 25% currently marketed supplement contains prohibited substances.^[5]

Another concern for the use of health supplements in India is the widespread availability of counterfeit products in the market. It has been recently highlighted that about 60-70% of dietary supplements being sold across India are fake, counterfeit, unregistered and unapproved. These counterfeit

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products not only have lower efficacy but may be extremely hazardous^[6]

The present study was conducted to assess the prevalence and type of nutritional supplement use in members of different gymnasiums, the reasons for use, the frequency of use and prevalence of adverse effects and problems arising with the use of nutritional supplements.

The results from this study are intended to help generate recommendations regarding dietary supplement use among young athletes who regularly consume nutritional supplements.

MATERIAL AND METHODS

Participants

155 participants across 6 health centers in Lucknow were enrolled in the study. The Gym were categorized as Premium, normal and Economy based on the yearly membership fees and the facilities provided at the gym. The participants were explained about the study objectives and informed consent were obtained from all the participants.

A draft questionnaire was filled by five subjects before the start of the study to determine the question language and clarity. The participant’s personal details like name and address were made anonymous.

Questionnaire

The study questionnaire contained 17 questions divided into three parts: the first part was about the demographic characteristics of the participants mainly age and gender. The second part enquired about the fitness routine of the participants which included frequency of gym visit, time of visit and type of exercise done by the participants. The third part of the questionnaire containing 10 questions related to the use of gym supplements: the type of gym supplement, the monthly expenditure on the gym supplements, brands, the source of procurement, reason for the use of gym supplements and other related question. The fourth part of the questionnaire contained the questions pertaining to the pharmacovigilance: the frequency and the type of adverse effects and the outcome of adverse effect related to the use of gym supplements was questioned.

The end part of the questionnaire mentioned the details of the researcher who could be contacted by the participants of the study.

Statistical analysis

Statistical analyses was conducted using the Graph pad prism (version 6.01) computer software package. Data are presented as frequencies (%). Statistical significance was accepted at P < 0.05 in all cases. Correlation was performed by Chi-square test.

RESULTS

The response rate of participation was 100% and total of 155 questionnaires were received. The characteristics of the participants were observed in Table 1: The fitness centers were classified on the basis of monthly charges and facilities provided in Table 2.

Most of the participants were males (72.2%) and the higher use of supplement was seen in the age group of 18 to 25 years

(29%). Most of the participants were undertaking Strength training (45.16%) followed by mixed training (34.8%)

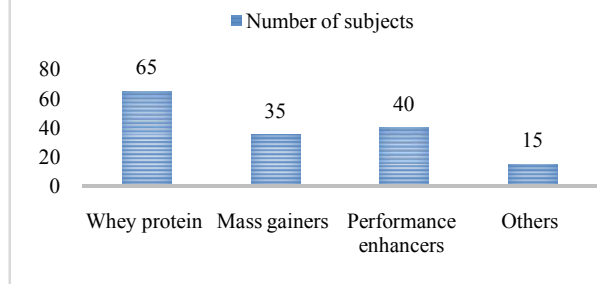
Table 1 Characteristic features of participants

Variable	N	(%)	
Gender	Male	112	72.2
	Female	43	27.7
Age group	18-25 yrs.	45	29
	25-35 yrs.	42	27
	35-45 yrs.	30	19
	45 and above	38	24
Type of gym*	Premium	40	25.8
	Normal	53	34.19
	Economy	62	40
Type of training	Strength training	70	45.16
	Yoga(isolated)	14	9.03
	Aerobics(isolated)	17	10.9
	Mixed training	54	34.8

Table 2 Gym categorization*

	Facilities	Average Monthly Charges (₹)
Premium	Strength training, cardio, dietary counselling, sauna, aerobics and cross fit	3500 and Above
Normal	Strength training and cardio	1500 to 3499
Economy	Strength training	Less than 1500

Figure 2: Type of gym supplements used



The type of supplement most commonly used was Whey protein (41.93%), followed by performance enhancing drugs such as anabolic hormones, creatine, BCCA (Branched chain amino acid) and other recovery agents. Some of the participants also used herbal and Ayurveda supplements. (Figure 2)

A positive correlation was observed in the preference of gym supplement and the type of exercise undertaken. A higher use of Whey protein was observed in individuals who were primarily performing strength training (P<0.05) Table 3

Table 3 correlation between whey protein use and strength training

	N	CHI Square Test
Whey protein users	70	Chi square value=61.101
Strength training	65	P value=<0.05

The preference and type of Whey supplement use was also questioned. The most commonly used type of whey protein was Whey isolate (38.7%) followed by low carb whey blend (25.8%). Other respondents (20.6%) took whey proteins enriched with other substances such as creatine, BCCA and herbal extracts.

The primary reason for the use of gym supplement in most of the participants was body building and muscle gain (45%). 24.5% participants took supplement to enhance gym performance and a large group of individuals (22.5%) were taking supplement for weight loss.

Majority of the respondents (71%) had the idea of the availability of counterfeit product in the market however only a few (n=35) individuals actually authenticated the product based on the bar code method. 54% of the individuals consulted the gym trainer before buying the supplement, 15% consulted an online Dieticians regarding the use of supplements however none of the participants consulted the medical expert before buying the supplements.

The participants were enquired about the source of procurement of the gym supplement and was noted that majority of the individuals (41.9%) would buy the supplement from the local non franchise shop. 30% individuals bought the supplement from the supplement brand shops. 22% individuals bought the supplement from the online e commerce sites such as Amazon.in, Flipkart or heathkart.

The last part of the questionnaire enquired about the adverse effects associated with the use of gym supplements. (Table 4 and 5)

Majority of individuals experienced some sort of adverse effects with the use of gym supplements (63.2%) and the most commonly encountered adverse effect was related to the GI tract including nausea, bloating and abdominal pain. Next most commonly experienced adverse effect was associated with the skin such as acne and alopecia. Small group of individuals experienced psychological effects such as insomnia and mood changes.

Table 4 The experience of adverse effects

Experienced any type of adverse effects with the use of gym supplements	N	(%)
YES	98	63.2
NO	57	36.7

Table 5 Types of adverse effects experienced

Adverse effects	N	(%)
GI disturbances (Abdominal pain, Nausea, bloating sensation)	35	35.7
Mood changes	04	4.08
Insomnia	18	18.36
Dermatological (acne and alopecia)	22	22.44
Others	19	19.38

The outcome of adverse effect was also questioned, 51% of the individuals reduced the frequency of taking the supplement but did not completely stop the use of the supplement on experiencing an adverse effects. 23% individuals completely stopped the use of supplement. 20% needed a doctor consultation for the adverse effects. 6% of the respondents did not change alter the use of supplement despite experiencing adverse effects.

The adverse effects experienced by the respondents were analyzed and causality assessment was done, the data was then reported by our pharmacovigilance associate in the Vigiflow database through our ADR monitoring center.

DISCUSSION

The aim of the study was to determine the preference for the use of gym supplement by the individuals undertaking physical training. The study also highlighted about adverse effects associated with the use of supplements. Our study was conducted across three categories of fitness centers (Normal, Premium and Economy) in order to increase the variability of subjects in the study.

The study has significantly higher number of male participants (72%) denoting that higher use of gym supplements is common in males. It is similar to other studies conducted across the globe.^{[7][8]}

Our study showed that the highest prevalence for the use of gym supplements in the age group of 18 to 25 years. The data gathered by us was in conformity with the previous studies.^[9] This age group has the highest chances to be influenced by the narratives of the fitness industry.

The study showed that protein supplements in the form of Whey protein are most commonly used by individuals undertaking gym supplements. The results in our study are in conformity with the previous studies^{[10][11]}

The result of our study denoted that supplements containing performance enhancing substances such as creatine are used by approximately 40% of the individuals. The results are closely related to study done by Bianco A. *et al*^[12].

This study also highlighted that the close to 30% individuals take gym supplement in order to “gain muscle mass”. This is similar to our study where 45% of the individuals cited this as the primary reason to take gym supplement.

The study also questioned about the knowledge of the participants about the availability of counterfeit products in the market, strikingly 71% individuals had the idea of the counterfeit supplements in the market. However this knowledge was not sufficient to take necessary actions and only a few individuals(22%) would authenticate the product.

Nearly half of the individuals questioned in our study would decide the type of supplement and the source of procurement on the advice of the gym trainer instead of a certified dietician or a physician. Therefore there is a need to sufficiently train the gym instructors and coaches to be able to provide accurate and scientifically sound information on dietary supplements to the exercisers.

Our study also focused on the adverse effects associated with the use of gym supplements. 63% individuals in our study experienced some sort of adverse effects with the use of gym supplements. This was similar to a study conducted at a fitness center in Tehran^[13]

With regard to the type of side effects, the supplement users commonly experienced abdominal discomfort, weight gain, nausea and vomiting. These adverse effects are most commonly associated with the use of whey proteins.

Other adverse effects such as acne and baldness seems to be the direct effect of consumption of anabolic steroids. Some of the individuals also experienced neuropsychiatric symptoms such as mood changes, aggressiveness and insomnia which may also be attributed to the use of steroids and performance enhancing agents.^[14]

The study conducted by us was limited to the routine gym attendees and was not focused on professional athletes and body builders, where the preference for the use of gym supplements would have been different.

CONCLUSION

To the best of our knowledge, this was the first study conducted across different categories of fitness centers in a north Indian town. The study not only highlighted the age wise prevalence for the use of gym supplements but also gathered

data on the preference for the use of gym supplement. The study also highlighted the adverse effects associated with the use of gym supplements.

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