

SHORT COMMUNICATION

The Prevalence of Sport Dietary Supplements Consumption among Male Students in Guilan University of Medical Sciences, Guilan, Rasht, Iran

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ABSTRACT

Background: Humans rely on food and supplements to meet their nutritional needs. Athletes often use supplements like protein to support their training needs. So understanding the supplement consumption needs can help tailor health promotion strategies. This study aimed to assess dietary supplement consumption among male medical students at Guilan University of Medical Science, Guilan, Rasht, Iran.

Methods: In a cross-sectional survey, 121 male medical students of Guilan University of Medical Sciences were enrolled. The demographic (age, gender, and level of education) data, the type of sport activity, the length of exercise in sports, the use or non-use of nutritional supplements, the type of supplement, and the reason for taking supplement were determined.

Results: Totally, 107 (88.4%) students reported sport activities, while 14 (11.6%) did not have any sport activities. Out of 121 students, 8 (6.6%) had underlying diseases, while 113 (93.4%) did not report any underlying diseases; 17 (14%) had no major sport field, 62 (51.3%) did bodybuilding, fitness and cross-fit, 17 (14%) conducted ball sports, 3 (2.5%) carried out martial sports, 8 (6.6 %) undertook running sport, 3 (2.5%) performed cycling, 6 (5%) participated in swimming sport, and 5 (4.1%) practiced yoga.

Conclusion: A significant prevalence of dietary supplement consumption was noticed among male students who involved in various sport fields; while many of them were aware of the associated health risk factors. It seems that there is a need to educate and guide male students regarding safe supplementation practices of supplements to control the potential adverse effects.

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Introduction

A total of 90% of people were demonstrated to lack receipt of essential nutrients from their daily foods that can lead to an inadequate intake of essential nutrients based on standard dietary guidelines. So nutritional supplements can bridge this gap to establish a balanced nutrition (1, 2). Many people use sport supplements as health benefits, weight loss or muscle building, and their consumption shows a rising trend in gyms. So the sport nutritional supplements market has grown and it is crucial to recognize the safe supplements for everyone; while similar to medications, supplements contain active ingredients that may cause side effects and interactions too and it is advisable to consult a healthcare professional before their use (3, 4). This trend raises concerns about the reasons for the use of dietary supplements and their potential impact on health status. As enough investigation has not been undertaken on the effectiveness of these supplements by Food and Drug Administration (FDA), the effect of these supplements has always been questionable (5). On the other hand, some illegally supplements in the markets were shown to be harmful and with side effects that can induce liver and kidney damages, gastrointestinal problems, dehydration, allergic reactions, etc. (6-8). Professional and amateur athletes are increasingly using supplements such as whey, casein, and soy protein to help build muscle structure (9, 10). Joint supplements such as creatine, branched-chain amino acids (BCAAs), glucosamine, multivitamins, green tea, caffeine, glutamine, nitric oxide and hormones have been similarly utilized (3, 11-13). Understanding the prevalent use of these supplements can help promote health strategies. So this study was undertaken to assess the prevalence of nutritional supplement use among male medical students in Guilan University of Medical Science, Guilan, Rasht, Iran and explore factors influencing

their consumption.

Materials and Methods

In an analytical-cross-sectional study in 2020 using a cluster sampling method in Guilan University of Medical Sciences, Guilan, Rasht, Iran, 121 male medical students were enrolled. The study aimed to explore the frequency and reasons behind the consumption of dietary supplements among these students. The inclusion criteria were being more than 18-year old, to be male and a medical student and having cooperation to participate in the study and provide an informed consent. Questionnaires with less than 75% of the answered questions and individuals who declined to participate were excluded. The questionnaire consisted a group of closed-answer questions (yes-no questions) and open-ended questions to assess the demographics information (age, gender, and level of education), the type of sport activity, the length of exercise, the use or non-use of nutritional supplements, the type of consumed supplement, and, the reason for taking supplements.

The research was adhered to the principles outlined in the Declaration of Helsinki and was approved by the Ethics Committee of Guilan University of Medical Sciences (Ethical code No. IR.GUMS.REC.1400.178). The collected data were analyzed using SPSS software (version 16, Chicago, IL, USA). A significance level of 0.05 was chosen for the statistical analysis. The formula of

$$n = \frac{z_{1-\alpha/2}^2 p(1-p)}{d^2}$$

was used to determine the sample size while it was the type 1 error, p was the ratio estimated in the studied population, and d was the error rate (accuracy). The sample size of 121 individuals was calculated based on a type 1 error of 0.05, a maximum error of 0.06, and a population ratio estimate of 0.63 as described by Liu *et al.* (1).

Table 1: Demographic characteristics of studied participants.

| Characteristics | Condition | Percent | Number | Mean | Standard deviation |
|-----------------|-----------|---------|--------|--------|--------------------|
| Age (year) | <20 | 8.3 | 10 | 26.31 | 3.81 |
| | 20-25 | 27.3 | 33 | | |
| | 26-30 | 57 | 69 | | |
| | >30 | 7.4 | 9 | | |
| Weight (Kg) | <60 | 4.1 | 5 | 77.15 | 8.45 |
| | 60-80 | 66.9 | 81 | | |
| | 81-100 | 28.2 | 34 | | |
| | >100 | 0.8 | 1 | | |
| Height (cm) | <160 | 1.7 | 2 | 176.77 | 5.81 |
| | 161-180 | 86.7 | 105 | | |
| | >180 | 11.6 | 12 | | |

Table 2: The amount of nutritional supplements consumed.

| Variable | Frequency | Percent |
|--------------|-----------|---------|
| Keratin | 42 | 34.7 |
| Whey protein | 32 | 26.4 |
| Against | 20 | 16.5 |
| Casein | 14 | 11.6 |
| Arginine | 16 | 13.2 |
| Taurine | 2 | 1.7 |
| Amino acid | 30 | 24.8 |
| BCAA | 42 | 34.7 |
| HMB | 9 | 7.4 |
| ZUMA | 9 | 7.4 |
| CLA | 10 | 8.3 |
| Beta-alanine | 16 | 13.2 |
| Glutamine | 55 | 45.5 |
| L-carnitine | 18 | 14.9 |
| Glucosamine | 3 | 2.5 |
| Omega 3 | 55 | 45.5 |
| Multivitamin | 41 | 33.9 |
| Vitamin A | 18 | 14.9 |
| Vitamin D | 43 | 35.5 |
| Vitamin B3 | 43 | 35.5 |
| Vitamin D3 | 37 | 30.6 |

BCAA: Branched-chain amino acids, HMB: Hydroxymethylbutyrate, CLA: Conjugated linoleic acid.

Table 3: Reasons presented to use nutritional supplements.

| Variable | Frequency | Percent |
|---------------------------|-----------|---------|
| No comment | 23 | 19 |
| Increased self-confidence | 8 | 6.6 |
| Increased strength | 40 | 33 |
| Physical readiness | 21 | 17.4 |
| Health | 3 | 2.5 |
| Recommendation of friends | 2 | 1.7 |
| Bulking | 1 | 0.8 |
| Getting enough protein | 1 | 0.8 |
| Muscle building | 22 | 18.2 |

Results

Totally, 81.2% of male medical students (99 out of 122) consumed supplements; while 10 (8.3%) were in the age group less than 20 years old, 33 (27.3%) were in the age group of 20-25, 69 (57%) were in the age group of 25-30, and 9 (7.4%) were in the age group of older than 30 years old. Among these students, 5 individuals (4.1%) weighed less than 60 kilograms, 81 (66.9%) were between 60 and 80 kilograms, 34 (28.2%) were in the weight range of 80-100 kilograms, and one individual (0.8%) was more than 100 kilograms. Regarding height, 2 students (1.7%) were below 160 centimeters, 105 (86.7%) were in the range of 160-180 centimeters, and 14 (11.6%) were taller than 180 centimeters (Table 1). Totally, 171 students declared working out of home (88.4%), and 50 subjects (41.3%) exercised without a coach. Table 2 shows the prevalence of nutritional

supplement use among medical students. The most common consumed supplements were omega-3 (45.5%), glutamine (45.5%) and BCAAs (34.7%). The common reasons to consume supplements were to increase the strength (33.0%), physical readiness (17.4%), and muscle building (18.2%) (Table 3).

Discussion

The role of role of dietary ingredients in cell function was described before (14, 15). The results of our study showed that 81.2% of male medical students (99 out of 122) in Guilan University of Medical Sciences consumed supplements to cover their nutritional ingredients needs that can be a high prevalence of sport supplements use among these students. This prevalence of supplement use is higher than a previous report of sport supplements use (46%) among medical students in Ardabil, Iran

by Ojaghi *et al.* (15). This could be attributed to the fact that 88.4% of the students were actively engaged in sport exercises. Also, Bandyopadhyay *et al.* found that 82.5% of male medical school students used supplements ($p < 0.001$) which is in line with our findings (16). In this study, more than half of the students (55.4%) stated that they were acquainted with supplements use by the coach advices, which is completely consistent with the study undertaken by Ekramzadeh *et al.* indicating a decline in the use of alternative advertising methods, like the internet to acquaint information for supplements. It seems that sports club trainers should improve their understanding of the possible advantages and disadvantages of sports supplements (17).

Furthermore, our research revealed that the most common supplements were omega-3 with glutamine and BCAA. In Liu *et al.*'s study, the most commonly used were calcium and vitamin B supplements (18). In our study, the most common reasons for taking supplements were to increase strength, physical fitness, and muscle building and more than half of the students participated in bodybuilding and strength sports; which increased the need to use supplements. Our findings are not in line with Wiens *et al.*'s study revealing individuals to utilize supplements to maintain their health, boost their energy level, enhance their immune system, and promote their overall performance (19). About 12% of students did not participate in any sports activities, which may result in not taking any supplement. Overall, our study highlighted diverse reasons why students chose to take supplements, with a clear correlation between sport participation and supplement use. Future deeper researches are essential to be undertaken to determine motivations behind the supplement use among different populations.

About 42% of the students in our study had an exercise without any coach, which in turn can cause injuries for these students. About 33% of these students declared the reason to take supplement in order to increase their strength. It is worthy of discussion about the type of supplement they consumed and the effectiveness of that supplement. Additionally, understanding the potential risks associated with their supplement use, especially without a professional guidance can be crucial in their overall health and well-being. It seems future researches can be conducted to evaluate the impact of marketing and peer influence on supplement choices among young adults.

Other reasons were also reported in our study to take supplements including an increase in self-confidence, to increase the strength, physical fitness and health status. The recommendations to use

supplements were by friends to gain muscle mass and to receive enough protein; even 19% of students had no opinion about the reasons to take supplements. It is suggested that health policymakers to widely inform the students about the benefits and harms of supplement use and to educate them on their potential risks before making an informed decision. By increasing awareness and providing accurate information, policymakers can help guide individuals towards healthier supplement choices (15).

There were limitations in our study. Only male students participated in our study that can be a limitation to enhance consistency. It seems that female students are needed to be included too to compare the gender impact. Another limitation can be our small sample size, which can impact the generalizability of these findings. The exclusive focus on supplement use has been among medical students, which limits the results' for a broader applicability in other populations. Investigating the prevalence of supplement use among students in other fields to capture a more comprehensive understanding of supplement consumption trend can be beneficial. The results of ours study underscored the critical role of sports coaches in facilitating access to essential supplements for medical students, emphasizing a need for continuous education and training programs for sport coaches in the realm of sport supplements.

Conclusion

The high prevalence of sport supplements consumption among medical students of Guilan University of Medical Sciences indicates an increasing trend of sport supplements use in this population. So there is a need to educate students about the advantages and disadvantages of sport supplements use. Also, the role of the club trainers to inform and educate this group to use sport supplements properly is of great importance as some of these supplements commonly caused gastrointestinal side effects including nausea and vomiting, diarrhea, and kidney and liver diseases. Therefore, ensuring safe supplement intake is paramount, particularly when students have pre-existing medical conditions that require careful management and monitoring during supplements intake.

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This study was conducted according to the guidelines stated in the Declaration of Helsinki and all procedures were approved by the ethics committee of Guilan University of Medical Sciences (Ethics approval code: IR.GUMS.REC.1400.178). Written informed consent was obtained by participants prior to study commencement.

Authors' Contribution

MM wrote and drafted the manuscript. SB, MM, KG, AT, ZKK and KD Contributed to investigation, data collection and Validation. MMR designed the study and conducted the methodology. KD, MM and MMR performed analysed and interpreted the results. SB and KD Contributed to the research concept, supervised the work and revised the manuscript. All authors read and approved the final manuscript.

Conflict of Interest

None declared.

References

- Bernstein M, Munoz N. Position of the Academy of Nutrition and Dietetics: food and nutrition for older adults: promoting health and wellness. *J Acad Nutr Diet*. 2012;112:1255-77. DOI: 10.1016/j.jand.2012.06.015.
- Masoumi A, Zeini Jahromi N, Masoumi S, et al. The Relationship between Alternative Healthy Eating Index and Dental Health among Health Care Workers: A Cohort-Based Cross-Sectional Study. *Int J Nutr Sci*. 2024;9:227-235. DOI: 10.30476/ijns.2024.102706.1325.
- Alfieri A, D'Angelo S, Mazzeo F. Role of Nutritional Supplements in Sport, Exercise and Health. *Nutrients*. 2023;15:4429. DOI: 10.3390/nu15204429. PMID: 37892504.
- Feili A, Sabet A, Mokhtari M, et al. Ranking of Shiraz Top Fitness Clubs Regarding Nutritional Knowledge, Attitude, and Performance of Sport Trainers Using Multi-Criteria Decision Making Approach. *Int J Nutr Sci*. 2018;3:139-144.
- Starr RR. Too little, too late: ineffective regulation of dietary supplements in the United States. *Am J Public Health*. 2015;105:478-85. DOI: 10.2105/AJPH.2014.302348. PMID: 25602879.
- Brown AC. Kidney toxicity related to herbs and dietary supplements: Online table of case reports. Part 3 of 5 series. *Food Chem Toxicol*. 2017;107:502-19. DOI: 10.1016/j.fct.2016.07.024. PMID: 28755953.
- Binns CW, Lee MK, Lee AH. Problems and prospects: public health regulation of dietary supplements. *Annu Rev Public Health*. 2018;39:403-20. DOI: 10.1146/annurev-publhealth-040617-013638. PMID: 29272167.
- Foti C, Calogiuri G, Nettis E, et al. Allergic contact dermatitis from vitamins: A systematic review. *Health Sci Rep*. 2022;5:e766. DOI: 10.1002/hsr2.766. PMID: 36210883.
- Abreu R, Oliveira CB, Costa JA, Brito J, Teixeira VH. Effects of dietary supplements on athletic performance in elite soccer players: a systematic review. *J Int Soc Sports Nutr*. 2023;20:2236060. DOI: 10.1080/15502783.2023.2236060. PMID: 37462346.
- da Silva Duarte NM. Supplementation with Whey Isolate and its Influence in Muscle Hypertrophy and Strength on Amateur Athletes: A Randomized Trial: Instituto Politecnico do Porto (Portugal); 2018.
- Karinch M. Diets designed for Athletes: Human Kinetics; 2002.
- Daryanoosh F, Mehrabani D, Sotoudeh V, et al. The Effect Of Intensive Exercise And Consuming Estrogen Supplement On Deposition Of Calcium And Bone Strength During Sixteen Weeks In Ovariectomy Rats. *Sport Biomotor Sci*. 2009;3:64-71.
- Daryanoosh F, Sharifi GR, Jafari M, et al. the effect of running exercise and calcium supplementation on femoral bone strength in ovariectomized rats. *Global Vet*. 2013;11:694-700.
- Mehrabani D, Masoumi SJ, Masoumi AS, et al. Role of diet in mesenchymal stem cells' function: a review. *Int J Nutr Sci*. 2023;8:9-19. DOI: 10.30476/ijns.2023.97788.1221.
- Ojaghi H, Abbasi V, Masoumi R, et al. Frequency of supplement and multi-vitamins uses rate among Ardabil medical students, Iran. *Int J Comm Med Public Health*. 2016;4:216-9. DOI: 10.18203/2394-6040.ijcmph20164741.
- Bandyopadhyay K, Ray S, Vashisht S, Bhalla GS, Sarao MS. Knowledge and Practices About Protein Supplement use Amongst Students of a Medical College. *J Marine Med Society*. 2019;21. DOI: 10.4103/jmms.jmms_65_18.
- Ekramzadeh M, Taherinasab S. The Prevalence of Sport Dietary Supplements Consumption among Male Athlete Students in Shiraz University of Medical Sciences, Shiraz, Iran. *Int J Nutr Sci*. 2017;2:218-23.
- Liu H, Yang Y, Xu D, et al. Investigation and Comparison of Nutritional Supplement Use, Knowledge, and Attitudes in Medical and Non-Medical Students in China. *Nutrients*. 2018;10:1810. DOI: 10.3390/nu10111810. PMID: 30463386.
- Wiens K, Erdman KA, Stadnyk M, et al. Dietary supplement usage, motivation, and education in young, Canadian athletes. *Int J Sport Nutr Exerc Metab*. 2014;24:613-22. DOI: 10.1123/ijsnem.2013-0087. PMID: 24667342.