

Analysis of the consumption of nutritional supplements by practitioners of physical activity in fitness centers

Análise do consumo de suplementos nutricionais por praticantes de atividade física em academias de ginástica

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ABSTRACT

The consumption of nutritional supplements and pharmaceuticals has increased in an abusive way all over the world. The concern with body esthetics and ease of sale has led the population to use indiscriminately what can harm health. The aim of the study was to analyze the use of nutritional supplements by bodybuilders in gyms in order to know if there is consumption and if there was prior knowledge about the effects caused by food supplements and by who was recommended (whether a qualified professional or own

initiative). The research was conducted through a multiple-choice questionnaire applied to 100 individuals who regularly practice bodybuilding, between 18 and 30 years old, in gyms in São José do Rio Preto, São Paulo, Brazil. Among those interviewed, 75% used nutritional supplements; 30% got nominations from Personal Trainers or even friends 28%; 24% used the internet as a source of information; 88% do not know the effects caused by overuse; 29% use whey protein (Whey Protein) and 25% use BCAA amino acids (Branch Chain Amino Acids); 16% thermogenic and 10% creatine. Based on the results, it can be concluded that the consumption of nutritional supplements is frequent, usually without guidance from a trained professional and incorrectly or even excessively by users. This increases the concern about the use of food supplements without the supervision of a nutritionist.

Keywords: Supplementation, Food supplements, Health, Nutritionist, Gym.

RESUMO

O consumo de suplementos nutricionais e farmacêuticos tem aumentado de forma abusiva em todo o mundo. A preocupação com a estética corporal e a facilidade de venda tem levado a população a usar indiscriminadamente o que pode fazer mal à saúde. O objetivo do estudo foi analisar o uso de suplementos nutricionais por fisiculturistas em academias a fim de saber se há consumo e se havia conhecimento prévio sobre os efeitos causados pelos suplementos alimentares e por quem foi recomendado (se profissional habilitado ou próprio iniciativa). A pesquisa foi realizada por meio de um questionário de múltipla escolha aplicado a 100 indivíduos que praticam regularmente musculação, entre 18 e 30 anos, em academias de ginástica da cidade de São José do Rio Preto, São Paulo, Brasil. Entre os entrevistados, 75% usavam suplementos nutricionais; 30% receberam indicações de Personal Trainers ou mesmo amigos 28%; 24% usaram a internet como fonte de informação; 88% desconhecem os efeitos causados pelo uso excessivo; 29% usam proteína whey (Whey Protein) e 25% usam aminoácidos BCAA (aminoácidos de cadeia ramificada); 16% termogênico e 10% creatina. Com base nos resultados, pode-se concluir que o consumo de suplementos nutricionais é frequente, geralmente sem orientação de profissional treinado e de forma incorreta ou até excessiva pelos usuários. Isso aumenta a preocupação com o uso de suplementos alimentares sem a supervisão de um nutricionista.

Palavras-chave: Suplementação, Suplemento alimentar, Saúde, Nutricionista, Academia.

1 INTRODUCTION

Currently, one of the characteristics of the population is the increase in their concern with health and body appearance. Therefore, in recent years there is greater demand for gyms and weight training, as well as for supplementation.

The Brazilian Society of Exercise and Sports Medicine (SBME) establishes that the intake of protein food supplements is beneficial only to high-performance athletes, however, the practice of supplementation has become common due to its ease of marketing and this has encouraged population to use these products in an abusive way, with ergogenic and purely aesthetic purposes, which can harm health (SBME, 2009).

According to Resolution No. 661, of 2018, of the National Health Surveillance Agency (ANVISA), nutritional supplements are presented in pharmaceutical forms in order to supplement the diet with nutrients, bioactive substances, enzymes or probiotics, isolated or combined in addition to the diet of healthy individuals in the case of restrictive diets, metabolic changes, intense physical activity, among others. They should be consumed in cases where intake from food is insufficient, or when the diet requires supplementation. Food supplements are not medicines and, therefore, they are not used to treat, prevent or cure diseases (Brasil, 2018).

The nutrients present in the formulation in larger quantities can be proteins and amino acids, vitamins, minerals, carbohydrates and fibers, lipids and fatty acids, isolated or combined in accordance with ANVISA's CFN Resolution No. 390/2006. However, these substances should not replace food or be considered an exclusive food source (Brasil, 2006).

According to ANVISA's Resolution RDC No. 18, of 2010, nutritional supplements are classified into vitamin and mineral supplements; hydroelectrolytics; energetics; protein; for partial meal replacement; of creatine and caffeine (Brasil, 2010).

By using nutritional supplements under the guidance of a qualified nutritionist, the athlete can gain benefits, such as improving physical performance, endurance, willingness and recovery between workouts, in addition to reducing fatigue and body fat, as well as minimizing disease risks due to improved immunity (Cardoso et al., 2017; Guedes da Silva; Rodrigues Júnior, 2020).

However, if consumed indiscriminately and without monitoring by a qualified professional, it can harm health, including hypertension, acute myocardial infarction, stroke, dehydration, increased body fat, depending on the amount used, the supplements end up generating overload of the organs responsible for metabolism, causing endocrine, renal, cardiovascular and liver diseases, which can lead to organ failure and even death (Cardoso et al., 2017; Sperandio et al., 2017).

Despite media and industry appeal, studies show that not all supplements sold in the market have been shown to significantly improve athletic performance (Binns et al., 2018).

Most of the risks associated with supplements are related to irregular products, that is, that contain substances in their composition that have not been evaluated or even that have already been evaluated, but which are not allowed due to insufficient data on their safety or because there is evidence of damage to health (Brasil, 2018).

Thus, through the increasing use of nutritional supplements by practitioners of physical activities and diets, this research aimed to assess their consumption and know their use by 100 individuals who practice bodybuilding, between 18 and 31 years old, in gyms in the city of São José do Rio Preto – SP, in order to identify whether there was prior knowledge about the effects caused by dietary supplements and by who was recommended.

2 MATERIAL AND METHODS

First, the research project was submitted to the Ethics Committee at Plataforma Brasil, after approval, the work was conducted using multiple-choice questionnaires applied to 100 practitioners of physical activity, aged between 18 and 30 years. This research was carried out in gyms in São José do Rio Preto – São Paulo, from February to March 2019.

2.1 SAMPLE

The 100 participants were chosen among 10,000 members of the total number of gyms that participated in the research, located in the city of São José do Rio Preto, in the state of São Paulo, Brazil.

In addition to being between 18 and 30 years old, athletes should meet the following criteria: be a bodybuilder in gyms for at least 01 year; Be able to answer the questionnaire related to the research; Be able to give your express informed consent to participate in the study. Athletes of both genders were interviewed to prepare the survey.

2.2 SAMPLING

The questionnaire was applied directly to 100 participants, held for 02 months in February and March 2019. The questions were structured with multiple-choice questions about the use of nutritional supplements and the interviewee's knowledge about the subject.

The questions described to respondents were as follows: Have you ever used nutritional supplements? If yes, why? Who suggested the use? What supplements did you use? How did you get information about food supplements? If you know of any unwanted effects or harm caused by nutritional supplements? Have you noticed any unwanted defect in your own body? How long did you use the supplement? Would you recommend or have you already indicated to someone?

Participants were given the Terms of Free and Informed Consent (TCLE) to collect the athletes' signature and confirmation that they were aware of the research.

2.3 RESEARCH RISKS AND BENEFITS

This work offers minimal risk because it is a research that involves answering a questionnaire applied to volunteers, with the possibility of loss of data confidentiality on the part of the researcher.

As for the benefits of the research, these are based on the importance of informing athletes about the incorrect use of nutritional supplements and its importance when done correctly and consciously, especially in prevention and health care aimed at the non-development of pathologies caused by excessive use and without prior guidance from a qualified professional.

2.4 DATA ANALYSIS METHODOLOGY

The results were analyzed and correlated among the research volunteers according to the aforementioned criteria. An informational program was used to characterize the sample and the application of appropriate statistical tests was used to analyze the relationship between the variables.

3 RESULTS

The survey was conducted with 100 respondents and conducted through a questionnaire containing multiple choice questions. The profile selected for the research was regular attendees of bodybuilding gyms, aged between 18 and 30 years, who used or are using at least one type of nutritional supplement for more than a year. The objective was to identify the level of knowledge of users in relation to excessive consumption of supplementation and the risks that such a practice can bring to the body.

Among the participating volunteers, 75% of respondents use or have used a nutritional supplement, where 65% used it for more than a year, as shown in Table 1.

Table 1 – Percentage of athletes who use or have used supplements, reasons and time of use (n=100).

Does or has used supplements:	
Yes	75%
No	25%
Reason for use:	
Hypertrophy or mass increase	39%
Esthetics	28%
Performance improvement	14%

Medical treatment	13%
Other reasons	6%
Consumption time:	
More than a year	65%
Less than a year	35%

As observed in Table 1, the main reason for use was with the objective of hypertrophy or muscle mass gain, 39% of athletes presented this objective and 28% due to concern with body esthetics, that is, improvement of physical appearance. Among the respondents, 14% of respondents seek to improve their physical performance during training, 13% for medical treatment and 6% for other reasons.

Table 2 describes how the athletes purchased the supplements and 41% of respondents bought them in a supplement store and 34% online, the most common places. The supplements were purchased in a pharmacy by 17% and 6% in the gym itself. It was also found that 30% of these were indicated by their personal trainer, only 22% used by medical or nutritionist suggestion.

Table 2 – Information on who indicated the administration of nutritional supplements and where the purchase was made.

Who suggested the use of supplements:	
Personal Trainer	30%
Family or Friends	28%
Medical or nutritionist	22%
Others	12%
None	8%
Where the athletes purchased the supplements:	
Supplement store	41%
Internet	34%
Drugstore	17%
Gym	6%
Family or Friends	2%

One of the questions addressed in the questionnaire was whether the practitioner had any prior knowledge about the use of supplements, 40% said they sought information before starting to use them. The way in which practitioners learned about food supplements is shown in Table 3.

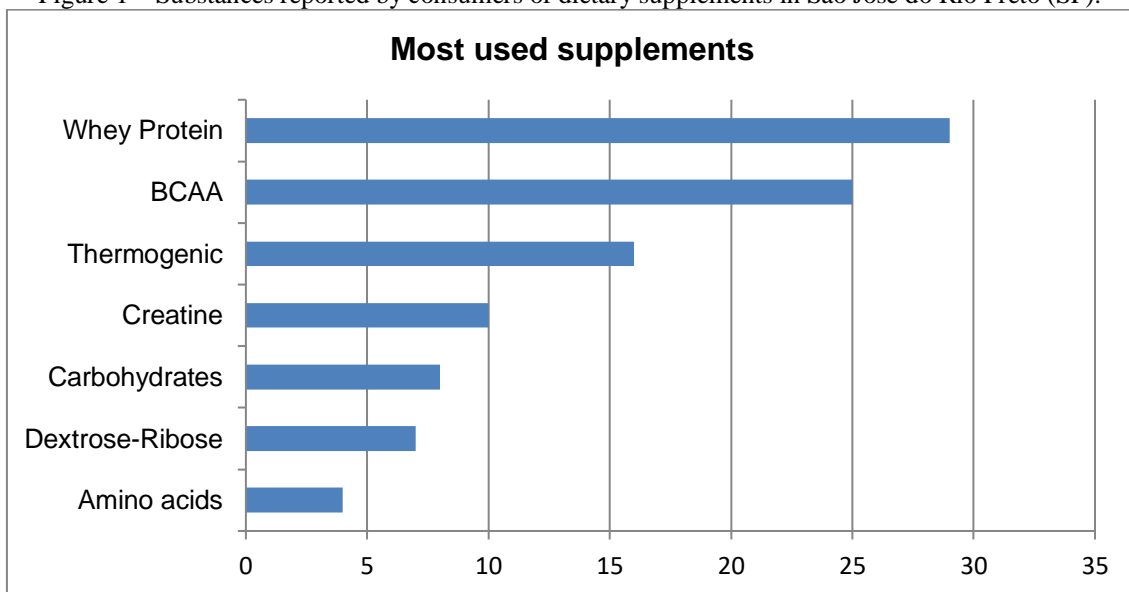
Table 3 – How was the knowledge acquired about the administration of nutritional supplements.

Had prior knowledge about the use of supplements:	
Yes	40%
No	60%
How did they acquire information about the use of nutritional supplements:	
Internet	24%
Medical sources/scientists	20%
Family or Friends	19%

Personal Trainer	15%
Supplement store	14%
Medicine package or Others	8%

About obtaining information about the use of nutritional supplements, 24% of respondents acquired it through internet research, only 20% through medical sources and scientists, 19% through acquaintances such as family and friends and only 15% through the personal trainer. Of the 100 respondents, 14% in stores and 8% in package inserts (Figure 1).

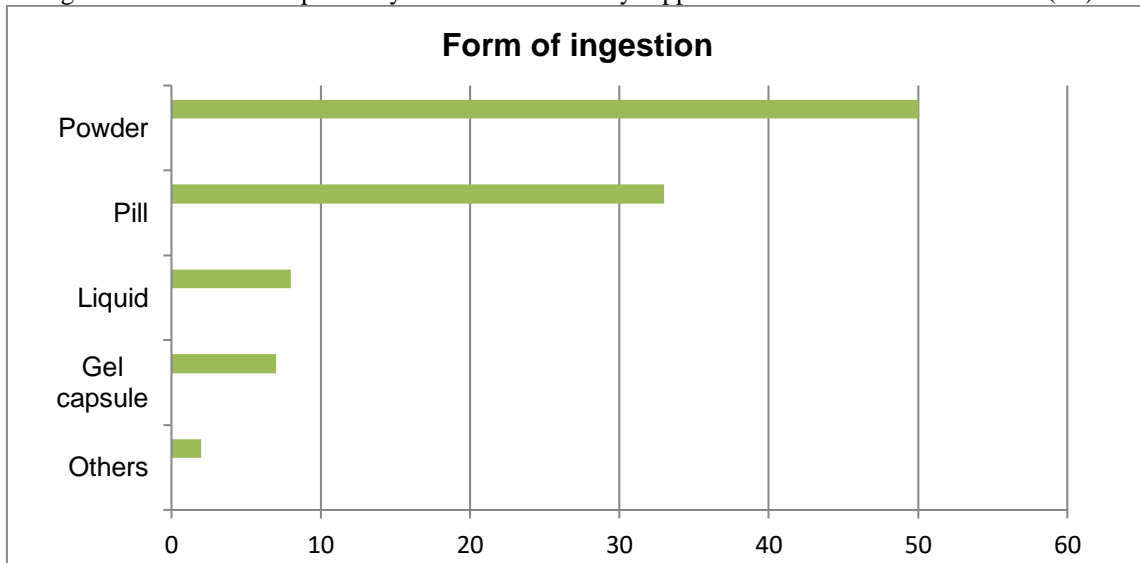
Figure 1 – Substances reported by consumers of dietary supplements in São José do Rio Preto (SP).



The most used supplements among practitioners were hyperprotein (Whey protein – whey protein) 29%, due to its rapid absorption in the first hours, providing large amounts of amino acids in the bloodstream; followed by branched chain amino acids (BCAA) 25%; 16% thermogenic as an accelerator for metabolism and use of body fat as an energy source.

The pharmaceutical form most used by respondents is powder diluted in water forming a 50% shake, followed by the ingestion of 33% pills, as shown in Figure 2.

Figure 2 – Substances reported by consumers of dietary supplements in São José do Rio Preto (SP).



Another part of the questionnaire was about the knowledge of athletes regarding the unwanted or side effects of the use of supplements. Among users, 88% said they had no prior knowledge about the harm caused or some kind of unwanted effect.

Table 4 – Knowledge about the unwanted effects caused by the use of nutritional supplements.

Have knowledge about unwanted effects caused by the use of nutritional supplements:	
Yes	12%
No	88%
The user has noticed some unwanted effect on the body due to the use of supplements:	
Yes	5%
No	95%
Would indicate or have already indicated the use:	
Yes	74%
No	26%

About unwanted effects, 5% indicated already feeling or noticing something out of the ordinary, however, they could not distinguish whether they were caused by supplements or other substances used.

About 74% of respondents said they had indicated or would indicate the nutritional supplements they use to other people (Table 4).

4 DISCUSSION

Weight training has become a habit among teenagers, adults and seniors who seek to improve their health or physical performance. Thus, the number of practitioners in gyms has increased more and more.

Practitioners often attend gyms on their own, but also on medical advice or guidance from a nutritionist, with the purpose of muscle strengthening, weight loss, muscle mass gain or improved quality of life (Lopes et al., 2015).

When seeking healthier habits through the practice of physical activity, the athlete needs to include a balanced diet in their daily lives. However, the usual diet of most practitioners remains unchanged, yet there is an increase in the search for food supplements (Schuler; Rocha, 2018).

Therefore, from a self-administered structured questionnaire containing multiple choice questions, 100 regular bodybuilding practitioners were interviewed in order to know if there is consumption and if there was prior knowledge about the effects caused by food supplements and by whom it was recommended (if a qualified professional or own initiative).

Among those interviewed for the survey, 75% (n=75) have already used or use nutritional food supplement, of those who use it, 56% (n=42) were men with a mean age of 23 years and 44% (n=33) were women with an average age of 25 years.

The same assessment was performed by researchers Gomes et al. (2017) in the city of Cananéia in the state of São Paulo. They found that 53% of their respondents use food supplements, 60% male and 40% female, where 37% and 17% of these consumed supplements, respectively. Nogueira et al. (2015) also carried out this assessment in bodybuilding gyms in the city of João Pessoa – Paraíba. The authors found that 55% of 510 people also consume or have consumed food supplements, 79% men and 21% women. These percentages of supplement use are lower than those found in the present study (75%), however, they also indicate that there is a high number of people, both male and female, consuming food supplements after starting physical activities in a bodybuilding gym.

The Brazilian Society of Exercise Medicine and Sports (SBMEE) determines that the use of protein food supplements is beneficial only for high performance athletes. Therefore, for physical exercise practitioners who do not need high performance, the indication is that protein needs are acquired through food, noting that the additional consumption above the daily needs does not result in muscle mass gain, nor does it promote the increase performance (Carvalho et al., 2003).

Food supplements have been sought after by athletes with the goals of improving performance, reducing body fat and increasing muscle mass (Ferreira et al., 2016). The main reason for using supplements found in this research was with the intention of

hypertrophy or increase in muscle mass, 39% of athletes had this objective, followed by 28% who were concerned with body aesthetics. Among the respondents, 14% seek improvement in physical performance during training, 13% for medical treatment and 6% for other reasons.

In the literature, the main objectives of using supplements are to improve aesthetics, gain and define muscle mass and lose weight, with the most common exercises being aerobic, localized gymnastics, and especially weight training, as it provides muscle hypertrophy, weight loss and increased physical endurance (Frade et al., 2016).

In a survey conducted in three cities in the state of Minas Gerais, researchers Dos Reis et al. (2017) also observed that the main reason for the participants to practice weight training would be hypertrophy, 77.77% in Coimbra, 69.69% in Ervália and 75% in Viçosa. In the work of Schuler and Rocha (2018), the main objectives mentioned were hypertrophy, weight loss and health maintenance.

According to Naclerio et al. (2020), other concerns that make athletes seek supplements are to obtain healthy habits, post-training recovery and competition, or to increase their energy.

The high consumption of supplements is related to body self-perception, which is influenced by aesthetic standards of the media and society, and is directly linked to self-esteem, self-confidence and self-acceptance. The gym environment contributes to the advertising of stereotyped aesthetic standards, and with this factor the supplement market grows, with the support of the media to launch products with the promise of fast reaching these standards, through marketing without medical or nutritional prescription (Cheffer; Benetti, 2016).

From this, it is possible to verify that nutritional supplements are on the rise and easily available, consisting of combined substances or ingested in doses without reliable parameters, due to the lack of information and lack of guidance from a nutritionist or specialized doctor.

The personal trainer (30%), family and friends (28%), and physicians or nutritionists (22%) were the most cited sources of prescription by respondents in this survey. Other options (12%) and for 8% of athletes, no one suggested use, that is, consumption started on its own.

As in the present research, Souza and Schneider (2016) also observed that dietary supplementation has been increasingly used by gym goers and that most of them do not

have enough knowledge to use these products, despite this, they often start to use on their own initiative, indication of friends or gym instructors.

In a sample of 302 physical exercisers of both sexes, Moretti et al. (2018) reported that 70% of the physical exercisers who used food supplements made their own prescription; 19% prescribed by a professional nutritionist; and 11% by other health professionals. Authors Cheffer and Benetti (2016) also found that the prescription of supplements was made by the physical trainer, followed by the prescription made by friends and then by the nutritionist, with a percentage of only 21.43%, as in this research.

These studies show that there is little appreciation of the nutritionist as a trained professional for the prescription of nutritional supplements, which is contrary to what is stipulated by CFN Resolution No. 390/2006, which regulates the dietary prescription of nutritional supplements and establishes that the professional trained and qualified to carry out prescription of nutritional supplements is the nutritionist, who must respect the maximum levels of safety regulated by ANVISA (Brasil, 2006). Thus, it is up to the nutritionist to prescribe and guide the use of appropriate supplements when there are nutritional needs that are not supplied only by regular food sources. The prescription for the use of food supplements must be based on the individual's nutritional and health status and on scientific data.

The search for an unqualified professional, as well as the lack of information, lead to erroneous nutritional guidelines, which affect not only the performance of the practitioner of physical activity but also their health (Sommer et al., 2019).

Regarding how athletes acquired the supplements, the most mentioned places were the supplement store (41%) and the internet (34%). The supplements were also purchased at a pharmacy (17%) and at the gym (6%) (Table 2).

Another question addressed in the questionnaire was whether the practitioner had any prior knowledge about the use of supplements, 40% said they sought information before starting to use them (Table 3). Regarding the search for information about the use of nutritional supplements, 24% of respondents searched through internet research, only 20% through medical sources and scientists, 19% through acquaintances such as family and friends and 15% through the personal trainer; 14% in store and 8% in package inserts.

In their research, Lopes et al 2015 report that, in general, practitioners of physical activity do not seek information about the function of supplements and their adverse effects, which makes the intake of supplements indiscriminate.

The most used supplements in this study were those based on proteins and amino acids, highlighting Whey Protein (whey protein) (29%), followed by BCAA (25%) and thermogenic (16%) and creatine (10%), corroborating the results found by Gomes et al. (2018) in the city of Ouro Preto - São Paulo, which evaluated 124 people with a mean age of 29 years, with 48.4% using some type of supplement, predominantly Whey Protein (76.7%).

In the work of Moretti et al., (2018) 53.3% used protein (Whey Protein), 27.2% BCAA, 6.05% Casein, 6.0% Glutamine, 4.0% Albumin and 3.0% Creatine. In the research by Silva et al. (2018), performed with 100 bodybuilders, aged 20 to 59 years, of both sexes, the most used supplements were: BCAAs (59.4%), rich in proteins (50%), creatine (47.3%), rich in carbohydrates (35.1%), among others.

The high use of protein supplements can be explained by the belief that excess protein helps to increase muscle mass. Its indiscriminate and excessive use can trigger health risks such as increased risk of osteoporosis, increased blood cholesterol level, liver and kidney overload for metabolism and excretion of excess production of nitrogen and calcium (Ferreira et al 2016).

Nutritional supplements are marketed in tablet, capsule, gel capsule, powder or liquid form. The most acquired form by the individuals was powder, being diluted in water forming a shake 50% of the interviewees, followed by the ingestion of 33% pills, 8% liquid, 7% gel capsules and another 2% (Figure 2).

Regarding the knowledge of physical activity practitioners regarding the unwanted or side effects of using supplements, 88% said they had no prior knowledge about the damage caused or some type of unwanted effect.

If supplementation is correctly guided and by a qualified professional, it can improve physical performance, prolong endurance, reduce fatigue and perceived exertion, increase strength, disposition and recovery between workouts, decrease body fat and increase immunity (Cardoso et al., 2017). However, its excessive use and without the guidance of a nutritionist can cause many adverse health effects, including increased body fat, insomnia, dehydration, organ overload, diseases such as kidney, liver and endocrine disorders, hypertension arterial, stroke, acute myocardial infarction, psychosis and even death (Cardoso et al., 2017; Sperandio et al., 2017).

The lacks of information about the consumption of nutritional supplements together with self-prescription or by an untrained professional, even on the advice of friends, are worrying factors and are associated with risks to the individual's health. About

unwanted effects, 5% indicated already feeling or noticing something out of the ordinary, however, they could not distinguish if they were caused by supplements or other substances used by them.

Still, about 74% of respondents said they had indicated or would indicate the nutritional supplements they use for other people.

5 CONCLUSION

Most bodybuilders consume food or nutritional supplements. In this research, 100 regular users of bodybuilding gyms were interviewed, of which 75% have already made or are still using some type of supplementation. Of the individuals who use it, 56% are men and 44% women, with an average age of 23 and 25 years, respectively. The main objective for using supplements was hypertrophy or gain in muscle mass 39% and 28% use it because they are concerned with body aesthetics, 14% seek improvement in physical performance, 13% for medical treatment and 6% had other reasons. For most respondents there was no prescription by a qualified professional, only 22% had an indication of a nutritionist. The majority of athletes 30% and 28% started using it on the recommendation of a personal trainer or friends, respectively. The predominant supplements in the responses were Whey Protein, 29%, followed by BCAA, 25%, thermogenic 16% and creatine 10%. 88% of respondents do not know the effects caused by excessive use and 74% of consumers said they indicated or would indicate the nutritional supplements they use for other people.

Based on these data, there is a need for guidance from a qualified professional regarding the use of dietary supplements associated with regular physical activity, thus avoiding illnesses caused by excessive use and misconceptions spread in the sports environment and in the media. The trained professional, that is, the nutritionist, will also encourage the association of healthy and adequate food with professional monitoring in the practice of physical activities even before using any type of food or nutritional supplement.

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