

ORIGINAL

Relationship between Vigorexia, steroid use, and recreational bodybuilding practice and the effects of the closure of training centers due to the Covid-19 pandemic in young people in Argentina

Relación entre Vigorexia, uso de esteroides y práctica de musculación recreacional y efectos del cierre de los centros de entrenamiento por pandemia Covid-19 en jóvenes de Argentina

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Citar como: Caero L, Libertelli J. Relationship between Vigorexia, steroid use, and recreational bodybuilding practice and the effects of the closure of training centers due to the Covid-19 pandemic in young people in Argentina. Salud Integral y Comunitaria. 2023; 1:18. <https://doi.org/10.62486/sic202318>

Enviado: 14-06-2023

Revisado: 11-09-2023

Aceptado: 25-10-2023

Publicado: 26-10-2023

Editor: Prof. Dr. Javier Gonzalez-Argote 

ABSTRACT

The advance of stereotypes and preconceptions of what should be correct in relation to body image and the standards that society directly or indirectly imposes, as a measure and canons of what is socially accepted and weighted, leads many people to reinforce the idea of not falling within these ideals. The aim of this study was to relate the variables Vigorexia and steroid use, with the practice of bodybuilding in a group of people attending training centers for recreational or aesthetic purposes in Argentina. In the present study we will work with an observational, descriptive, and mixed non-experimental research approach; through the application of a validated questionnaire (Adonis Questionnaire), with the purpose of gathering information on the perception of concern about physical exercise and body image. The units of analysis corresponded to the 20 participants residing in the Autonomous City of Buenos Aires, Argentina in the period from June to December 2020 who practiced physical exercise in sports facilities. Fifty percent of the respondents belonged to the female sex, and 40 % were aged between 25 and 31 years. The mean score of the Adonis Questionnaire was 7,45 points. The results of this study do not show any general impairment in relation to the overall score of the Adonis Questionnaire, where 50 % of the sample studied had scores corresponding to body image concerns that did not affect daily life. A detailed analysis of the individual results of the study shows that the subjects show good academic-work perception.

Keywords: Vigorexia; Physical Exercise; Bodybuilding; Steroids; Training; Pandemic, Self-Image.

RESUMEN

El avance de los estereotipos y preconceptos de lo que debe ser correcto con relación a la imagen corporal y los estándares que la sociedad directa o indirectamente impone, como medida y cánones de lo socialmente aceptado y ponderado, lleva a muchas personas a reforzar la idea de no entrar dentro de dichos ideales. El objetivo de este estudio fue relacionar las variables Vigorexia y uso de esteroides, con la práctica de musculación en un grupo de concurrentes a centros de entrenamiento con fines recreativos o estéticos de Argentina. En el presente estudio se trabajará con el enfoque de investigación de tipo observacional, descriptivo, y mixto no experimental; mediante la aplicación de un cuestionario validado (Cuestionario de Adonis), con la finalidad de recabar información sobre la percepción sobre preocupación respecto al ejercicio físico, la imagen corporal. Las unidades de análisis correspondieron a los 20 participantes residentes en la Ciudad Autónoma de Buenos Aires, Argentina en el periodo de junio a diciembre de 2020 que practicaban ejercicios físicos en instalaciones deportivas. El 50 % de los encuestados pertenecía al sexo femenino, y el 40 % tenía edades entre 25 y 31 años. La puntuación media del Cuestionario de Adonis fue de 7,45 puntos. Los

resultados de este estudio no muestran afectaciones de manera general en relación con la puntuación global del Cuestionario de Adonis, donde el 50 % de la muestra estudiada tiene puntuaciones que corresponden a preocupación de la imagen corporal que no afecta la vida diaria. Un análisis pormenorizado de los resultados individuales del estudio muestra que los sujetos muestran buena percepción académico-laboral.

Palabras Clave: Vigorexia; Ejercicio Físico; Musculación; Esteroides; Entrenamiento; Pandemia; Autoimagen.

INTRODUCTION

The advance of stereotypes and preconceptions of what should be correct about body image and the standards that society directly or indirectly imposes as a measure and canons of what is socially accepted and weighted leads many people to reinforce the idea of not falling within these ideals.^(1,2,3)

As mentioned by López Muñoz, sociocultural aspects also have a significant impact on the subjects.⁽⁴⁾

It is vital to understand how modern life and its implications lead to the constant search for goals only attainable to a few since the heterogeneity and diversity of bodies are separate from the standards proposed by a consumer society.

As Hernandez proposes, the body marches as a cultural mediator. In this way, the ideal of body image carries values, beliefs, and aesthetic canons promoted by each society, a situation that can be at least frustrating and an unrealistic undertaking for many people. In many cases, such a condition leads people not to realize the adverse effects of hard workouts, arduous routines, constant diets, muscle care, and obsessive physique.⁽⁵⁾

There is a great expectation that such efforts could bring them into that segment of society so valued by the media, always seeking acceptance and recognition.

Many studies have demonstrated the importance of healthy lifestyles.⁽⁶⁾ The release of neurochemicals such as endorphins, a product of physical activity, have their action in the brain, causing immediate well-being and counteracting or reducing stress, anxiety, and depression.^(7,8,9)

At the same time, it can be considered a preventive in developing work or academic stress, personality disorders, social anxiety, and improvement of post-traumatic stress.

Physical activity improves cognitive functioning, emotional states, and self-concept.

However, exceeding a healthy lifestyle leads to limits that result in emotional discomfort, intra- and interpersonal problems, and symptoms of anxiety, fear, and anger when challenging goals are not met.^(10,11,12,13)

This search and exaggerated concern could be the germ of Vigorexia disorder, which is an exciting reason to study it and establish detection and prevention mechanisms.

Objective: To analyze the relationship between Vigorexia and the use of steroids with the practice of bodybuilding in a group of people attending training centers for recreational or aesthetic purposes in Argentina.

METHODS

This study had an observational, descriptive, and mixed non-experimental research approach through a validated questionnaire (Adonis Questionnaire) to collect information on the perception of concern about physical exercise and body image. On the other hand, to increase the reliability of the measurement, a structured interview of our design will be applied, which analyzes the presence of depression, anxiety, substance use, and the generation of alternatives to continue with their workouts in the face of the closure of sports facilities.

Type and design of the research

According to Sampieri, this research is of an explanatory type, given that it is aimed at responding to the causes of events, occurrences, and physical or social phenomena, with a non-experimental design by being carried out without manipulating variables and only observing the phenomena in their natural environment to then analyze them; cross-sectional since the units of analysis were observed at a single time during the study period corresponding to June to December 2020.

Population and sample

The universe was constituted by all residents in the Autonomous City of Buenos Aires, Argentina, from June to December 2020, who practiced physical exercise in sports facilities.

The units of analysis corresponded to the 20 participants who met the selectivity criteria (inclusion and exclusion), applying a non-probabilistic sampling by convenience; this type of sampling was used considering the ease of access and availability of respondents based on the context of the COVID-19 pandemic.

Inclusion criteria

- Individuals over 18 who practice physical exercise in sports facilities with a seniority greater than or equal to 3 months.

Exclusion criteria

- Older persons with a diagnosis of psychiatric pathologies.

Data collection techniques and instruments

Two instruments were used for data collection:

Adonis Complex Questionnaire (Adonis Questionnaire):

The original questionnaire, in its English version,⁽¹⁴⁾ has been translated and validated in Spanish, which was the version used in this research.⁽¹⁵⁾

Objective: to measure body image distortions or alterations, based on the theoretical model of Pope et al.

Characteristics of the questionnaire

The questionnaire has 3 dimensions: psychosocial effect of physical appearance, control of physical appearance, and concern about physical appearance.

- It consists of thirteen items, which assess the level of dissatisfaction about their physical appearance, has three options ranging from 0 to 39 score, then categorized to identify the level of vigorexia of volunteers, specifying the clinical prediction of symptomatology. The answers are divided into three options: "a," whose value is 0 points; "b," whose value is 1 point; and "c" whose value is 3 points. A score is obtained from the answers. The scores obtained are classified according to the numerical value of the sum of the answers you make, so that the scores of:⁽¹⁵⁾

- Between 0 and 9 points: Concern with your body image, but would not affect daily life.
- Between 10 and 19 points: Medium-moderate affection of this Adonis Complex (Muscle Dysmorphia). This condition does not seriously affect your life; however, if the score is closer to 19 points, how this body concern affects your life should be taken seriously.
- Between 20 and 29 points: If you suffer from Adonis Complex and it interferes negatively in your life, you should put yourself in the hands of a specialist to start a treatment.
- Between 30 and 39 points: You have a severe problem with your body image. Consult a mental specialist with knowledge of BDD without delay and begin treatment.

Clinical interpretation

Scores are between the values of 0 to 9, being considered mild vigorexia. Suppose scores between 10 to 19 points are obtained. In that case, it is considered a moderate alteration, being consigned a muscular dysmorphia, possibly having no consequences for the person. However, if it reaches approximately 19, it has considerable effects as an expression of concern for the person's physical image.

The values of 20 to 29 are considered as interference due to excess physical preoccupation, suggesting going to a health specialist to initiate therapy.

In the values of 30 to 39, it can be indicated that it is a priority to attend a mental health specialist to develop clinical and psychological treatment.

Validity and internal consistency of the instrument

The internal consistency reliability of the instrument can be estimated with Cronbach's alpha or with McDonald's omega method.⁽¹⁶⁾

Internal consistency reliability allows for determining the degree to which test items correlate with each other.

The internal consistency method allows estimating the reliability of a measurement instrument through a set of items that are expected to measure the same construct or a single theoretical dimension of a latent construct. The internal consistency value will be low when the data has a multidimensional structure. That is, there is no consistency in the scores that form the theoretical construct to be measured.⁽¹⁶⁾

In the particular case of this instrument, Cronbach's high reported in the version used was 0,880,⁽¹⁵⁾ considering this value on the reliability scale as "Good".⁽¹⁷⁾

The temporal reliability analysis (test-retest) obtained through the intraclass correlation coefficient (ICC) was $ICC = 0,707$ (95 % confidence interval=0,336-0,871).⁽¹⁵⁾

Based on these indicators, the instrument shows adequate psychometric characteristics and helps assess muscular dimorphism or vigorexia.

Structured interview

The structured interview has 14 questions of a semi-structured nature where it is analyzed in greater depth if there is the presence of depression, anxiety, or substance use, as well as the generation of alternatives to continue with their workouts in the face of the closure of sports facilities.

Procedures

The Google Forms platform (Google Form) was used for the questionnaire application, and the interview was conducted via WhatsApp.

Initially, the questionnaire and the survey were applied to a small group of individuals to identify misunderstandings, acceptance of the questionnaire in general, and the approximate time required to complete both instruments.

Potential respondents were then contacted and sent the Adonis questionnaire, and once they had completed the questionnaire, they were asked to apply for the interview. The units of analysis were defined as those individuals who completed both the questionnaire and the interview.

Ethical aspects

The survey and interview were anonymous and were applied after the approval of the informed consent, where it was clear the commitment of the researcher that the data would not be communicated to third parties, who undertook not to disclose data that would allow the identification of the respondents.

Statistical processing

Descriptive statistical techniques were used: absolute numbers and percentages and inferential statistics.

The results of the variables were processed using Microsoft Excel and the SPSS statistical package.

The nonparametric Kolmogorov-Smirnov test was used for comparisons because most variables did not have a normal distribution. Spearman's correlation coefficient (r) was used to establish the relationship between the variables.

Differences were considered significant with p values less than 0,05.

RESULTS

The results of applying the Adonis questionnaire to the 20 respondents and the sociodemographic data are presented.

Table 1. Distribution of respondents according to gender		
Gender	N	%
Female	10	50 %
Male	10	50 %
Total	20	100 %

Source: Data collection questionnaire.

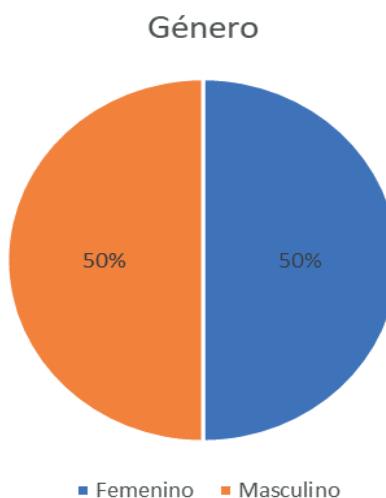


Figure 1. Distribution of respondents according to gender
Source: Data collection questionnaire.

Table 2. Distribution of respondents by age range		
Age range	N	%
25 to 31 years old	8	40 %
32 to 38 years old	7	35 %
39 to 45 years old	4	20 %
46 to 50 years old	1	5 %
Total	20	100 %

Source: Data collection questionnaire.

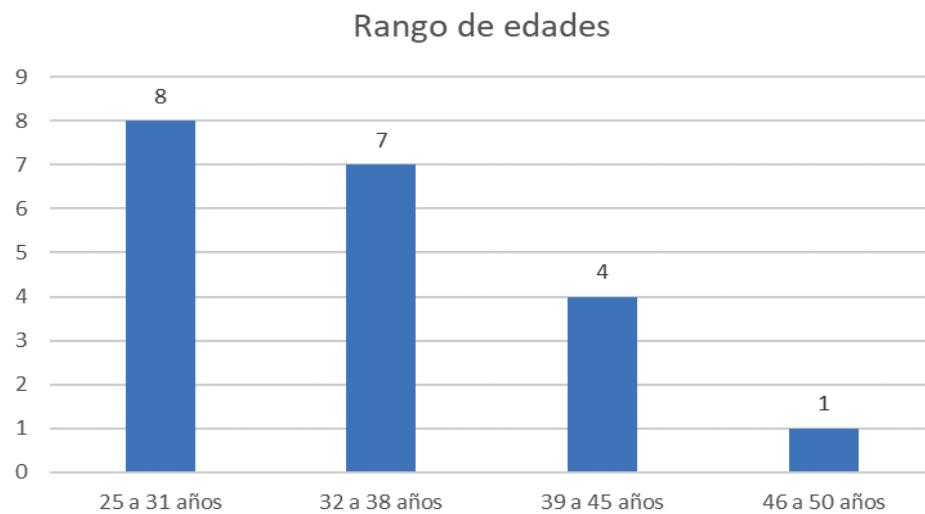


Figure 2. Distribution of respondents according to age range
Source: Data collection questionnaire

Table 3. Distribution of respondents according to item values in the Adonis Questionnaire				
	Media	Median	Standard Deviation (SD)	Kolmogorov-Smirnov test
Item	0,70	0	1,08	P=0,014
Daily time spent worrying about some aspect of appearance	0,65	1	0,75	P=0,091
Frequency with which you "feel bad" about any appearance-related issue	0,25	0	0,44	P<0,001
The frequency with which you avoid having parts of your body or your whole body seen by others	0,80	1	0,89	P=0,032
Daily time spent on grooming activities to enhance appearance	0,85	1	1,04	P=0,052
Daily time spent in physical activities to improve your physical appearance	1,55	1	1,28	P=0,085
The frequency with which you follow diets by eating special foods or taking nutritional supplements to improve the appearance	1,40	2	0,94	P=0,001
Part of your income is spent on appearance-enhancing activities	0,20	0	0,41	P<0,001
The frequency with which activities related to your physical appearance affect your social relationships	0,10	0	3,20	P<0,001
The frequency with which your sex life has been affected by your appearance-related concerns	0,00	0	0,00	DE = 0
The frequency with which concerns with appearance or appearance-related activities have compromised your job or career	0,15	0	0,37	P<0,001
Frequency with which you have avoided being seen by other people because of your appearance concerns	0,80	0	1,20	P=0,011
Use of drugs, legal or illegal, to gain muscle, lose weight, or for any attempt to improve your appearance	0,00	0	0,00	DE = 0
How often have you taken extreme measures (other than drug use) to change your appearance?	7,45	8	4,01	P=0,719

Source: Data collection questionnaire

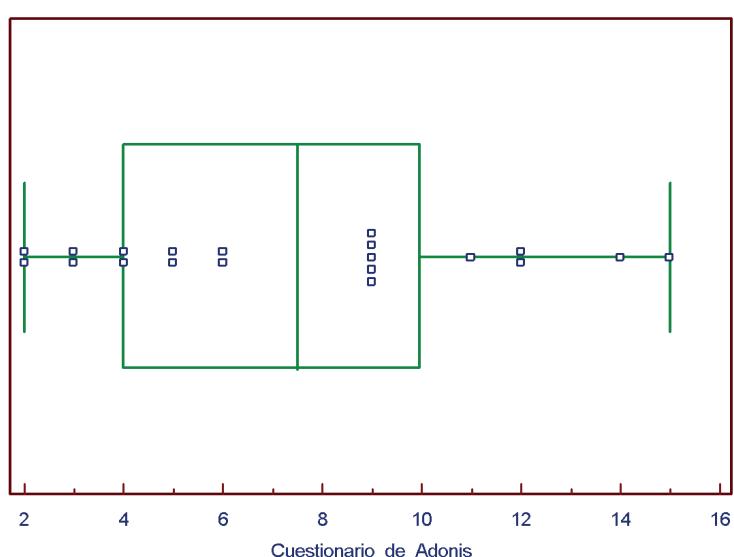


Figure 3. Distribution of respondents according to values obtained in the Adonis Questionnaire
Source: Data collection questionnaire.

Interview results

The results of the interviews, distributed in three areas, will be synthetically described.

Activities to improve physical appearance (food, diets, exercises)

To highlight that of those who performed physical exercises, 60 % performed physical exercises with an antiquity between 10 and 22 years; 4 had one year or less since the beginning of practicing, and the rest between 2 and 7 years.

Sixty-five percent of the respondents (13) performed weights as their primary exercise; other exercises performed by the respondents were aerobics, CrossFit, bodybuilding, soccer, cycling, paddle tennis, pilates, running, and yoga.

Forty percent of the respondents reported that the objective of physical exercise was for aesthetic or beauty purposes. Notably, 4 of the respondents (20 %) said that they exercise to feel good about themselves, and another 20 % said that they exercise to improve body composition. The rest mention being healthy as an objectives, and one mentions training for competitions.

Social and sexual relationships

Half of the respondents reported that they were not significantly affected by behaviors regarding training beyond the closing of gyms and training centers. Those affected reported that the quantity, schedules, and adaptation to the new conditions were complex.

The closing of the training centers/gymnasiums during the social isolation due to the COVID-19 pandemic had an impact on the respondents from the affective point of view, the main ones being anxiety (45 %), sadness or depression (25 %), frustration or boredom (10 %), and 20 % were not affected.

All respondents sought strategies to exercise at home during the pandemic, including purchasing sports equipment.

After the pandemic, the primary strategy suggested by respondents was to continue training and adapt to the new measures or strategies for training post-pandemic by 70 %. Online training or equipping their gym at home is equally raised.

Substance use

40 % of the respondents consume products to improve their performance, regardless of type and quantity; of them, 3 of the respondents consume creatine, and 5 consume protein.

About anabolic products, 75 % of those who use performance-enhancing substances consume stanozolol; one consumes oxandrolone, and another consumes a cocktail of testosterone, stanozolol, Dianabol, and nandrolone. The pharmaceutical form used by all those who consume are tablets.

Concerning the age of consumption, 20 % consume non-systematically, while the rest have been consuming between 2 months and 5 years.

They obtained information about the products they consumed through friends or trainers, and only one

obtained it through books.

The main reason for those who decided to consume was to seek better physical or aesthetic performance. One of the respondents stated that he is aware that these products are harmful to the body.

DISCUSSION

Vigorexia is a mental disorder associated with excessive concern for their physical condition where they feel decreased muscle mass, but in reality, they are hypertrophic.⁽⁸⁾

The concept of the Adonis Complex refers to general aspects related to male body dissatisfaction. Although muscle dysmorphia is contemplated within this spectrum, the Adonis Complex goes beyond and includes other reasons for body dissatisfaction, such as alopecia or penis size.⁽¹⁸⁾ However, there is confusion between the terms. The Adonis Questionnaire, although not presented as a measure of muscle dysmorphia, is designed for it.⁽¹⁹⁾

The results of this study do not show affectations in a general way about the global score of the Adonis Questionnaire, where 50 % of the sample studied have scores that correspond to body image concerns that do not affect daily life. The scores found are much lower than Latorre-Román et al., who found a 21,24 average score, presenting 45,5 % of the subjects with a moderate Adonis complex;⁽¹⁵⁾ on the other hand Molero López-Barajas reports an average of 19 points and 62,8 % moderate degree of pathological concern.^(17,20,21,22,23)

The results obtained in the Adonis complex in the sample of this study are similar to the research of Ayensa et al. (2005),⁽²⁾ in which the percentage of subjects with severe or pathological scores is meager, 0,0 %, and 1,20 %, respectively. The results on the total Adonis scale in this study are similar to those provided by Baile et al. (2011)⁽¹⁹⁾ in gym users (7,37±9,45).

Although the degree of importance and dedication to appearance among the interviewees, the values were in the low number associated with vigorexia according to the Adonis Questionnaire, in some indicators such as time dedicated to appearance per day, frequency of self-loading with appearance, time dedicated to physical activity for appearance, frequency of dedication to a specific diet, financial expenses for appearance and use of medications for appearance.^(24,25,26)

De Macedo et al. (2019)⁽²⁷⁾ argue that dissatisfaction with self-image brings new followers to bodybuilding rooms. However, this environment often reflects beauty standards and aesthetic models of low body fat content and high figures of lean mass.

The preoccupation with and control of physical appearance factors are closely related to each other, and this finding would support the literature that considers body dysmorphic disorder as belonging to the obsessive-compulsive spectrum.⁽²⁸⁾

In a recent meta-analysis of muscle dysmorphia symptomatology and associated traits that included a total of 31 empirical studies, the use of the Muscle Dysmorphic Disorder Inventory (MDDI) was found to be duplicative of the Adonis Questionnaire as a measure of muscle dysmorphia assessment.⁽²⁴⁾

Ultimately, it is more beneficial to assess muscle dysmorphia using specific measures, such as the Muscle Dysmorphic Disorder Inventory, rather than general measures of different aspects of male dissatisfaction, such as the Adonis Questionnaire.⁽¹⁸⁾

A detailed analysis of the individual results of the study shows that the subjects show good academic work perception, similar to other studies. Another aspect that was not affected was the use of extreme measures to change appearance.^(29,30,31,32)

Comelli (2020),⁽³³⁾ in a sample of gym users in the city of Asunción, concludes in this regard that a high frequency of vigorexia accompanied by the practice of dieting and the consumption of nutritional supplements is evidenced, exposing those who present the diagnosis to nutritional and general health alterations. Results that differ from our study.

Regarding coping with the pandemic and the development of physical exercise, no striking results were found; the sample studied found strategies to cope with it to a greater or lesser extent and to continue developing activities at home; however, they report symptoms compatible with anxiety, although only with what was collected in the interviews is not enough to assert that there was an anxiety disorder from the clinical point of view or depression.^(34,35,36)

The supplements most frequently consumed by the respondents were protein powders, which was to be expected since most of them perform bodybuilding exercises, so their objective is to gain muscle mass and increase its size. Also, the study conducted by Rodriguez R et al. (2011) in Chile on the consumption of nutritional supplements in gyms revealed that more than half of the users consumed them (54,5 %), and the type of supplements most consumed about their nutrient composition were proteins (55,6 %).

Although the consumption of substances to gain muscle is around 40 % of the sample studied, it is very striking that the perception of the use of drugs to improve appearance is an element that can be dangerous, primarily when the long-term effects on health are not known. In contrast to these results is how they obtained information about substance use, by recommendation, and the motives, primarily aesthetic.^(1,37)

In this research, we observed a result superior to that found in other studies, such as that of González-Martí et al. (2018)⁽³⁸⁾ and Olivardia et al. (2000),⁽³⁹⁾ which verified concomitance in 44,4 % and 46 % of the male sample, the use of anabolic steroids (AS).

The use of anabolic steroids among individuals with muscle dysmorphia has been demonstrated in other studies with relationships between dependence on these hormones and the presence of this disorder.^(40,41)

As seen in the literature, there is a specific relationship between the consumption of AE and the consumption of substances (legal and illegal). However, several aspects differentiate the steroid user from the classic drugs of abuse; on the one hand, users of AE do not ingest AE to achieve an immediate acute intoxication, and on the other hand, the AE user is characterized by a constant concern for the improvement of his or her physical appearance, as a result of this preoccupation with body image, which sometimes leads to muscular dysmorphia, dependence on AEDs can occur. Users define this very mild dependence as a psychological addiction due to the perceived confidence when using AEs, which they refer to as these psychological benefits that encourage them to continue consuming.

De Macedo et al. (2019)⁽²⁷⁾ report a high cost of AEs, considering that most do not have a medical prescription. They resort to the black market at prices much higher than pharmacies. The authors found that economic income is an element that favors access to these substances, where only 4 % of individuals bought their drugs at the pharmacy with a prescription. Only 36 % sought medical follow-up during the use of AEDs.

Specifically, concerns the type of AE, beyond the commercial brands, this study found similar results to that found by González-Martí et al. (2018),⁽³⁸⁾ where Deca-Durabolin® (78 %) was the most used drug and de Macedo et al. (2019)⁽²⁷⁾ found that Durateston® was used in 84 %. The similarity between them is that they are the most popular and widespread androgenic steroids marketed in popular pharmacies.

Sixty-five percent of those surveyed performed weight lifting as their primary physical exercise, reinforcing our previously stated point of view. In this sense, Pope et al. state that, in weightlifters, muscle dysmorphia is closely related to the use of EA; those with more significant concerns and behaviors focused on the appearance of a muscular body showed a 3.3 times higher of using AE, on the other hand, Hildebrandt et al. in a sample of 201 American students from Mount Sinai School of Medicine in New York, reported that compulsive exercise, dietary control and illicit drug use, were significant predictors of positive beliefs about AE.^(14,42)

Comelli (2020)⁽³³⁾ reported in his study that the exercise primarily performed was weights or bodybuilding, which aimed to increase body mass and accompanied their routine with particular dietary practices such as diet and consumption of nutritional supplements (68 %).

This author also adds that athletes often follow specific dietary plans accompanied by nutritional supplements to meet their increased requirements.

MD is an emerging phenomenon in society; the pressure it puts on men to appear more muscular and thinner has often led to psychological and behavioral disorders compared to anorexia and bulimia nervosa. Exercisers are particularly susceptible to developing body image disorders due to the pressures surrounding athletic performance and social trends that promote muscularity and thinness. Therefore, the study of vigorexia is becoming an essential element in the analysis of the psychosocial health of athletes.⁽¹⁵⁾

Among the study's limitations, firstly, it is highlighted that only the respondents' perception was counted, without contracting with other tests or psychometric or medical evaluations that could guide us on psychiatric pathologies. Another element was that the perception of body image was not contrasted with anthropometric indicators. Regarding the use of EA, no studies were conducted on its dosage. These limitations open the way and support the need for further research with a transdisciplinary approach in order to diversify the perspective of analysis of the problem and to be able to develop more effective intervention strategies.

In conclusion, the findings of this study reject the hypothesis of the existence of self-image conflicts in the sample studied; despite this, it is supported that vigorexia disorder and concern for muscularity and body image represent the main risk factors for the use of EA, especially among weightlifters. However, other elements are required for a better explanation of the phenomenon.^(43,44)

This research could serve as a starting point to identify individuals at higher risk for drug use and AE, allowing interventions to be targeted more specifically to this population, leading to more effective prevention of this widespread but still understudied form of substance abuse.

On another note, little evidence suggests that the pandemic notably affected the respondents' sports practice and increased anxiety and depression due to the confinement and closure of training centers.⁽⁴⁵⁾

Among the limitations of the present study, we can state firstly that the perceived disorders were measured using self-reports, a self-administered questionnaire, and a rating scale. On the other hand, the existence of vigorexia in the participants was not medically diagnosed, which could have biased the results with an overestimation or underestimation as a consequence, and this should be taken into account in the interpretation of the results of this study.

Nevertheless, the object of this study focused on assessing the respondents' perceptions of the effects of vigorexia on their environment, and this subjective perception must be taken into account if a correct picture

of how it influences the respondents' health is to be obtained.

In the future, other studies could be designed using triangulation of methods, including medical examination, in combination with the participants' perception, such as questionnaires, rating scales, and interviews to have a more comprehensive view of the problem addressed.

CONCLUSIONS

Based on the results of this study, it can be affirmed that the respondents were satisfied with their body image, and only mild vigorexia was detected. It was identified that at least up to the classification of moderate vigorexia, there is no evidence of body image distortion and a concern for physical appearance. On the other hand, despite having a low frequency, the consumption of steroids constitutes an alarm, considering the repercussions it can have on health.

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FUNDING

Article derived from the Final Integrative Work "Propensity to vigorexia, body image perception and recreational bodybuilding practice in the closing context of Covid-19 pandemic training centers in adults in Argentina", Universidad de Flores (Argentina). Deposit in institutional repository: <https://repositorio.uflo.edu.ar/entities/trabajo%20final%20integrador/d15aa7e0-36ea-4649-b8d6-67c9af6b7a23>

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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