



BJGH

Brazilian Journal
of Global Health
Revista Brasileira
de Saúde Global

Anabolics: the hidden side of steroid acquisition and use in São Paulo

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ABSTRACT

OBJECTIVE

To analyze patterns of use, acquisition, and predominant forms of anabolic-androgenic steroids (AAS) among adult men attending gyms in the city of São Paulo.

METHOD

A descriptive observational study conducted with 68 current or former AAS users, aged 18 to 59 years, recruited through an online questionnaire. Data were analyzed using descriptive statistics, with emphasis on specific types of AAS and acquisition channels.

RESULTS

Testosterone esters were the most frequently reported (72.1%), particularly Sustanon® (88.2%) and testosterone cypionate (52.9%). Dihydrotestosterone derivatives (oxandrolone and stanozolol) were used by 48.5% of participants. Cyclical use was preferred over continuous use (60.29%). Aesthetic motivation was predominant (91.17%). Illegal acquisition was significant (44.1%), with social media (33.8%) identified as the main source.

CONCLUSION

This study demonstrated a high frequency of AAS use for aesthetic purposes, surpassing other forms of use, and highlighted the issue of illegal acquisition, particularly through digital platforms and social media. These findings underscore the urgent need for stricter regulatory strategies and more assertive educational campaigns.

KEYWORDS

Anabolic steroids; Prevalence; Illegal acquisition; Gyms; Public health.

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DOI: <https://doi.org/10.56242/globalhealth.2025.5.18.10-13>

INTRODUCTION

The use of anabolic-androgenic steroids (AAS), synthetic derivatives of testosterone, has increased significantly not only among athletes but also among adults in the general population seeking rapid aesthetic results. These compounds are known to promote anabolism, resulting in increased muscle mass through the stimulation of protein synthesis.¹ However, consumption at supraphysiological doses is associated with major cardiovascular adverse effects, including atherosclerosis, hypertension, and left ventricular dysfunction, with an increased risk of thrombotic events and overall mortality.^{1-4,7}

The growing prevalence of non-therapeutic use of these steroids raises public health concerns, particularly among young adults. Studies worldwide highlight this issue, indicating increased use among adolescents and university students, often associated with other risk behaviors.^{8,9} In the Brazilian context, this reality is amplified by the large population of adult men attending gyms and the high prevalence of body dissatisfaction among adolescents.¹⁰

One of the main concerns associated with the unregulated use of AAS is their illegal commercialization, frequently linked to adulterated or counterfeit products. A study conducted by Justa Neves et al.¹¹ analyzed reports from the Forensic Science System of the Brazilian Federal Police, revealing that approximately 14.5% of the cases investigated involved anabolic-androgenic substances. These products often presented severe adulterations, absence of the active ingredient, and contamination with harmful substances, thereby increasing health risks for users.^{12,13}

This scenario underscores the urgent need for detailed investigation of AAS use in Brazil, particularly regarding prevalence, specific types of substances most frequently used, and predominant channels of acquisition, whether legal or illegal. Such analysis is essential for the effective development of public policies and educational initiatives aimed at reducing the risks associated with these substances and curbing their illegal trade.

In this context, the present study aimed to analyze the frequency and characteristics associated with AAS use among adult men attending Brazilian gyms, specifically identifying the most used classes and compounds, patterns of use, and, in particular, the forms of illicit acquisition of these substances.

METHODS

This was a descriptive observational study based on primary data collected directly through an electronic questionnaire (Google Forms). Data were obtained from adult male gym-goers in the city of São Paulo who reported current or past use of AAS. The sample was obtained by convenience sampling and included participants aged 18 to 59 years.

The questionnaire included sociodemographic data, specific types of AAS used, administration patterns (cyclical or continuous use), motivations for use, and, most importantly, acquisition routes (legal or illegal).

Data were organized and processed using Microsoft Excel software and analyzed descriptively with the objective of identifying the most frequently used anabolic steroids, the preferred patterns of use, and the predominant channels of illegal acquisition.

As this study was conducted using voluntary and anonymous responses collected via an online questionnaire, it received approval from the Research Ethics Committee (Approval nº 6.726.783), ensuring compliance with relevant ethical standards.

RESULTS

The sample consisted of 68 adult men attending gyms, aged 18 to 59 years, within the 21-39 age group (52,94%). Regarding gym membership fees, the majority (61,76%) attended facilities with monthly costs ranging from R\$100.00 to R\$250.00. It was observed that 91,17% of participants reported aesthetic purposes as their main motivation for AAS use, followed by enhanced sports performance and increased muscle strength. Cyclical (intermittent) use prevailed, chosen by 60,29% of users, whereas 39,71% reported continuous use (Table 1).

Table 1 - Participant Characteristics (N=68)

Characteristics	n	%
Age categories		
21 - 39 years old	36	52,94
40 - 57 years old	32	47,06
Gym Cost		
More than R\$500,00	6	8,82
R\$251,00 a 500,00	8	11,76
R\$100,00 a R\$250,00	42	61,76
Less than R\$100,00	11	16,17
Usage time of EAA		
<i>In cycles (intermitente)(n=68)</i>		
21 - 39 years old (n=36)	16	44,5
40 - 57 years old (n=32)	21	65,62
<i>Continuous use (n=68)</i>		
21 - 39 years old (n=36)	16	44,44
40 - 57 years old (n=32)	11	16,17
Motivation for use of EAA		
<i>Aesthetics (n=68)</i>		
21 - 39 years old (n=36)	33	91,66
40 - 57 years old (n=32)	29	90,62
<i>Physical performance (n=68)</i>		
21 - 39 years old (n=36)	2	5,55
40 - 57 years old (n=32)	1	3,12
<i>Treating medical conditions (n=68)</i>		
21 - 39 years old (n=36)	1	2,77
40 - 57 years old (n=32)	1	3,12

Source: Authors (2025)

A clear preference for testosterone esters was identified (72,1% of responses) by analyzing the specific types of AAS. Within this class, SustanonTM (testosterone phenylpropionate + testosterone propionate + testosterone decanoate + testosterone isocaproate) was the most frequently mentioned, with a prevalence of 88,2% among those who used testosterone esters. Testosterone cypionate ranked second within this class, reported by 52,9% of respondents.

Dihydrotestosterone (DHT) derivatives represented another important class, used by 48,5% of participants. Among these, oxandrolone was the most prevalent (44,1%), followed by stanozolol (29,4%). Nandrolone decanoate also showed significant relevance, being reported by 44,1% of participants. Other substances, such as trenbolone, drostanolone, methandrostenolone, and oxymetholone, were used on a smaller scale, yet remained relevant within the overall context of AAS use (Table 2).

Table 2 - AAS use by age group

AAS	21 - 39 years old (n = 36)	40 - 57 years old (n = 32)	TOTAL (n = 68)
Testosterone Ester Mix (Durateston®)	34	26	60
Testosterone Cypionate (Deposteron®)	19	17	36
Testosterone Enanthate	17	14	31
Oxandrolone (Anavar®)	17	13	30
Nandrolone Decanoate (Deca-Durabolin®)	19	11	30
Stanozolol	16	12	28
Testosterone Propionate	13	8	21
Trenbolone	11	8	19
Testosterone Gel or Cream (AndroGel®)	3	11	14
Oxymetholone (Hemogenin®)	8	6	14
Drostanolone (Masteron®)	8	5	13
Methandrostenolone (Dianabol®)	8	4	12
Boldenone Undecylenate	5	2	7
Nandrolone Phenylpropionate (NPP)	5	2	7
Methenolone (Primobolan®)	4	3	7
Fluoxymesterone (Halotestin®)	2	2	4
Testosterone Undecanoate (Nebido®)	-	2	2

Source: Authors (2025)

Regarding AAS acquisition, data were observed with respect to both legal and illegal procurement, highlighting a critical issue in the commercialization of these products (Table 3).

Table 3 - Sources and acquisition patterns of anabolic-androgenic steroids (AAS).

Origin	21 - 39 years old (n=36)	40 - 57 years old (n=32)	Total (n=68)
Legal acquisition (with prescription)	24 (66,7%)	22 (68,8%)	46 (67,6%)
Illegal acquisition (at least once)	22 (61,1%)	15 (46,9%)	37 (54,4%)
Illegal sources:			
Social media/internet	15 (41,7%)	8 (25,0%)	23 (33,8%)
Pharmacies without prescription-samigos e Friends/family	8 (22,2%)	4 (12,5%)	12 (17,6%)
Pharmacies without prescription	8 (22,2%)	7 (21,9%)	15 (22,1%)
Gyms	5 (13,9%)	5 (15,6%)	10 (14,7%)
Not informed	-	2 (6,3%)	2 (2,9%)
Exclusively illegal acquisition	22 (61,1%)	8 (25,0%)	30 (44,1%)

Source: Authors (2025)

Specifically, among participants aged 21 to 39 years, 66.7% reported legal acquisition of AAS through pharmacies with a medical prescription, whereas 61,1% indicated at least one acquisition from illegal sources. Among these, 22 individuals (61,1%) reported obtaining AAS exclusively from illegal sources, without resorting to regulated channels. The main illegal sources in this group were social media/internet (41,7%, n=15), pharmacies without medical prescription (22,2%, n=8), friends or family members (22,2%, n=8), and gyms (13,9%, n=5).

In the group aged 40 to 57 years, 68,8% of participants reported legal acquisition, while 46,9% indicated use of illegal sources. Of these eight individuals (25%) acquired AAS exclusively from illegal sources. In this group, the main sources were social media/internet (25%, n=8), friends or family members (21,9%, n=7), pharmacies without medical prescription (12,5%, n=4) and gyms (15,6%, n=5).

Overall, considering all participants, 67,6% of the sample reported legal acquisition of hormones at some point, while 44,1% reported exclusive acquisitions from illegal sources. Social media/internet (33,8%, n=23) was the most frequently cited illegal source, followed by friends or family members (22,1%, n=15), pharmacies without prescription (17,6%, n=12), and gyms (14,7%, n=10). Only 2,9% (n=2) did not report the source.

DISCUSSION

The use of AAS is a complex phenomenon with implications that extend beyond individual health, encompassing socioeconomic and public health dimensions. This study revealed relevant data on the frequency of use of these substances, detailing patterns of consumption and acquisition, motivations, and associated risks. The findings allow for an in-depth analysis of the medical factors involved, as well as insights into understanding the broader impacts and developing effective

public health interventions.

The high prevalence of AAS use for aesthetic purposes (91,17%) reinforces the significant influence of prevailing body image standards on individual perceptions, leading individuals to seek rapid methods to achieve idealized body patterns.^{13,14} This aesthetic motivation was consistent across both the 21-39 age group (91.66%) and the 40-57 age group (90,62%).

With respect to patterns of use, cyclical administration (60,29%) predominated, reflecting the mistaken perception of reduced risks. However, there is no robust scientific evidence to support such a strategy, since current data indicate that even during these cycles, users maintain supraphysiological hormonal concentrations, which may result in significant adverse effects due to suppression of the hypothalamic-pituitary-testicular axis.¹⁵

Concerning the choice of AAS, testosterone esters were the most frequently used (72,1%), especially Sustanon® (88,2%) and testosterone cypionate (52,9%). This preference is associated with the perception of relative safety and effectiveness, as well as their frequent use as the basis for cycles.¹⁵⁻¹⁷ Structurally, esters such as enanthate and cypionate present modifications that allow controlled release and prolonged effects in the body.⁵

DHT derivatives, such as oxandrolone (44,1%) and stanozolol (29,4%), were also widely used due to their specific properties, including the fact that they do not aromatize into estrogens, thereby reducing side effects such as water retention and gynecomastia. However, a chemical modification in their molecular structure that allows oral administration is associated with an increased risk of hepatotoxicity.^{18,19}

Nandrolone and trenbolone, both 19-nortestosterone derivatives, were also significantly reported. Nandrolone is often used for its high anabolic activity and lower androgenic activity but poses considerable risks of adverse effects following abrupt discontinuation.¹⁶⁻¹⁸ Trenbolone, originally developed for veterinary use, is notable for its high anabolic potency and significant neurological and cardiovascular risks, including neurotoxicity.^{6,20}

The high rate of exclusive illegal acquisition of AAS (44,1%), particularly through digital platforms and social media (33,8%), constitutes a major concern. This reality exposes a substantial regulatory and enforcement gap, facilitating easy and immediate access to potentially adulterated, underdosed or members, and pharmacies without prescription further highlights a broad clandestine distribution network, posing serious public health risks.

Such products, often of unknown origin, are not subject to sanitary controls and are frequently falsified, adulterated, or contaminated. Studies have shown that seized medications contained underdosed AAS and harmful adulterations, including contamination with heavy metals or inert substances such as talc.^{11,21}

The clandestine trade not only directly threatens the individual health of AAS users—exposing them to infections, unpredictable adverse effects, and therapeutic failures—but also aggravates the public health scenario.¹¹ The ease of access to these products—particularly through social media and digital platforms—further amplifies their dissemination.^{11,21} As shown in Table 3, 61,1% of men aged 21-39 years and 46.9% of men aged 40-57 years obtained AAS illicitly at least once, with 33,8% doing so through social media.

This high frequency of illegal access, with 44,1% of participants reporting exclusive reliance on clandestine sources, highlights enforcement failures and the lack of effective policies to curb this practice. This pattern reflects difficulties in adopting and applying effective strategies to limit indiscriminate access to these products, as well as deficiencies in police, investigative, and judicial measures for holding offenders accountable.^{22,23}

Indeed, the use of digital channels for AAS commercialization hinders tracking and regulation, enabling individuals to access substances that are potentially harmful to both individual and collective health.

Therefore, it is crucial to reinforce the enforcement of existing legislation, not only with a coercive aim—punishing those responsible for illegal sales—but also to ensure the protection of public health. Moreover, educational approaches are needed to alert the population to the risks associated

with the consumption of medications obtained through illicit channels, including adulteration and lack of medical supervision. Strategies such as awareness campaigns and strengthening reporting platforms may contribute to reducing demand for these products and weakening clandestine distribution networks.^{22,23}

CONCLUSIONS

This study demonstrated a significant frequency of AAS use among adult men attending gyms in Brazil, highlighting the predominance of aesthetic motivations and a concerning scenario of illicit acquisition, particularly through social media. These findings clearly indicate important shortcomings in regulatory policies and underscore the urgent need for effective measures of enforcement and regulation of these substances.

The data also reinforces the importance of targeted educational actions aimed at raising awareness of the risks associated with indiscriminate AAS use, particularly considering the potential risks related to adulteration and contamination of illegally marketed products.

Considering these findings, it is evident that the problem transcends the individual sphere, representing a collective risk that demands greater attention from health and security authorities. Combating the illegal sale of AAS should not be solely a matter of repression but also an opportunity to reassess protocols, guidelines, public policies, and enforcement strategies, thereby promoting population health and safety.

Finally, future studies should continue to explore these variables, preferably using longitudinal designs, to better understand long-term effects and to support the development of effective public health policies aimed at preventing the abusive and illegal use of anabolic-androgenic steroids.

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