Special Issue
Philosophical Dimensions of Medical Sciences

REVIEW

einstein
Official Publication of the Instituto Israelita de Ensino e Pesquisa Albert Einstein

e-ISSN: 2317-6385

Anabolic androgenic steroids are human enhancement drugs, not necessarily substance abuse

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DOI: 10.31744/einstein_journal/2026RW1998

ABSTRACT

This essay examines human enhancement drugs – particularly anabolic-androgenic steroids – through the lens of public health theory from the Global South. It critiques prohibitionist policies, which criminalize users while disregarding social determinants, as well as extreme relativism, which reduces consumption to individual autonomy alone. In contrast, harm reduction emerges as an evidence-based, user-centered approach that rejects criminalization, upholds human rights, and provides contextualized health responses. By reframing anabolic-androgenic steroids as human enhancement drugs, the analysis promotes a less moralistic perspective shifting the focus from individual behavior to broader societal pressures. Allied with Global South public health frameworks, harm reduction addresses the health needs of people who use drugs, prioritizing societal transformation over punishment.

Keywords: Anabolic androgenic steroids; Public health; Harm reduction; Lifestyle; Patient-centered care

INTRODUCTION

This essay proposes an articulation between the field of Human Enhancement Drugs (HEDs) – particularly anabolic-androgenic steroids (AAS)[1,2] – and the Latin American Public Health theoretical framework from the Global South. The analysis seeks to move beyond two conservative approaches: prohibitionism, which criminalizes users and ignores social determinants, and extreme relativism, which reduces drug use to presumed individual autonomy.

In response, we argue that harm reduction (HR), understood as both a social movement and an ethics of care, constitutes a coherent and effective framework for addressing the complexity of drug use.

Historical context

The concept of "human enhancement drugs" entered the scientific literature in the 1990s, with ethical debates intensifying thereafter, particularly around doping in bodybuilding and issues of fair play.[1,2] The topic later reemerged as a bioethical dilemma between treatment and enhancement in modern sciences,[3] especially in the context of doping and fair play in international bodybuilding competitions, but also as a broader phenomenon.[2]

A dedicated volume later examined its social, epidemiological, and criminological dimensions, delineating six subcategories: muscle drugs, weight-loss drugs, image-enhancing drugs, sex drugs and aphrodisiacs, cognitive enhancers, and mood or behavior enhancing drugs.[4]

How to cite this article:
Costa RM, Arruda MS, Keppler IL, Pasquim HM. Anabolic androgenic steroids are human enhancement drugs, not necessarily substance abuse. einstein (São Paulo). 2026;24(Spec 1):eRW1998.

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Received on:
Oct 21, 2025

Accepted on:
Nov 28, 2025

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Given these diverse categories that warrant in-depth discussion, this essay focuses on AAS, the most prevalent group, derived from testosterone (isolated in 1935), and now used by a wide range of populations beyond elite athletes.[5] Testosterone is the primary hormone responsible for the development of androgenic effects in the body.[6] Today, these effects are increasingly sought after by a range of social groups, not limited to elite male athletes.[7]

The global epidemiology of AAS indicates a marked gender disparity, with lifetime prevalence among males at 6.4% compared to 1.6% among females. In Brazil, systematic reviews confirm this pattern, reporting AAS prevalence among individuals engaged in recreational physical activity ranging from 2.1% to 31.6%, depending on region and sample characteristics. Users are predominantly males involved in gym-based resistance training and bodybuilding, with prevalence ratios indicating 2.6 male users per female and higher rates among individuals aged 18-44 years.[5] Additionally, AAS use has been associated with hypertension, left ventricular hypertrophy, arrhythmias, myocardial infarction, stroke, and sudden cardiac death, even among relatively young users. Erectile dysfunction, dyslipidemia, and psychiatric disorders have been reported.[6]

Phenomenon approach

The traditional perception of AAS use in scientific literature and clinical practice is often limited to either a prohibitionist or an extremely relativist approach, both of which are conservative. These frameworks are expressed, respectively, trough the criminalization of consumers orthe overvaluation of individual risk management. Both perspectives are criticized here for neglecting complexity and for sustaining the notion that collective responses are impossible, ultimately leaving the individual consumer guilty, criminalized, disillusioned, and exhausted.

Prohibitionist[8] drug policies have proven to be a failure as a social project, as they are incapable of about the profound transformations needed to effectively address issues related to AAS and other drugs. For example, in 1998 United Nations member states announced that that the world would be drug-free by 2008 – a goal that was renewed in 2009, reaffirming the aim to "minimize and eventually eliminate the availability and use of illicit drugs" (p.38).[9] The so-called 'war on drugs' has unequivocally failed against an inanimate adversary, ultimately functioning as a war constructed to persecute social groups, such as unwanted immigrants.[10]

On the other hand, extreme relativism, which views human enhancement as the result of presumed individual autonomy, is also problematic. Contrary to the idea that reality is composed of multiple random and equivalent narratives,[11] it must be acknowledged that choices are shaped both by specific survival needs and by the alienating characteristic of capitalist societies. Indeed, making choices is an inherent part of being human. Still, even when decisions are intentional, there is always a gap between decision and deliberate action.[12] In the specific case of AAS, characteristics include: use without medical supervision; supraphysiological doses; acquisition trough illegal markets; concurrent use of psychoactive substance use; uninterrupted over several years; replacement of proper meals, sleep, and training with AAS use;[13] as well as syringe sharing and improper injection techniques.[14] These features are related to the conditions under which choices and the options available to consumers. Attributing all of these practices solely to individual choice constitutes a form of reductionism referred to in this article as extreme relativism.

AAS as HED, beyond the health/disease dichotomy

Anabolic-androgenic steroids have established clinical uses but are also consumed to enhance or modulate aesthetics and performance, situating them within the HED framework. Such framing may avoid a priori moral condemnation, as accords with the term "abusive use." To enable a critical reflection, the non-moralizing HED framework is articulated in dialogue with Latin American Public Health. Anchored in this theoretical framework, the proposed discussion acknowledges the bodily optimization potential of HEDs in a world dominated by pressures for productivity, youth, leanness, and beauty.[14] This framework reveals internal and external pressures toward a bodily standard that constitute aesthetic oppression, affecting both psychic and social representations, and manifesting as social reproduction within a system of control – not restricted to AAS consumers – daily reinforced by language, culture, and media (notably fitness industry influencers), who display bodies unattainable for most people, thereby reduce health responses to mere lifestyle changes and risk management.

Human Enhancement Drugs, such as AAS, nootropics, analgesics, and others, are often legally prescribed for medical purposes but criminalized when used off-label for performance, cognitive, or aesthetic enhancement, revealing stark demographic disparities when compared, for example, with users of crack

cocaine or opioids. AAS users are typically young, white, employed males from middle-class backgrounds[7] engaged in gym culture or bodybuilding and driven by goals of muscularity and enhancement rather than addiction, whereas crack cocaine and opioid users often come from low-income, racial minority urban communities marked by unemployment, homelessness, and experiencing broader social disengagement. Despite these intersectional differences in class, race/ethnicity, gender, employment, and motivations, public health policies tend to overlook them, perpetuating inequalities and reinforcing stereotypes.

The traditional approach to issues associated with HED consumption tends to pathologize AAS users, often framing them as suffering from body dysmorphia or eating disorders. This pathologization erroneously transforms a social issue into an individual one, obscuring the social determinations that drive drug consumption. These internal and external pressures affect not only HED consumers; individuals who fail to meet certain aesthetic standards (e.g., fat people) are often cast as personal failure.[13] When this narrative proves insufficient, more radical interventions – surgical or biochemical[14] – come to appear mandatory (and highly profitable). By shifting responsibility onto the individual, this perspective normalizes the idea that everyday barriers – such as limited access to unbiased, dignified care, proper testing, and adequate follow-up – are solely the person's responsibility.

Beyond this violence (especially against fat people), similar values among AAS users reinforce the need to perform a specific body as an optimized, monitored, and displayed interface. This is not merely an individual choice and places pressure on everyone, demanding the consumption of commodities and bodily enhancements – often disconnected from oneself or the community – leaving marks on subjectivity. In other words, there is a widespread malaise today, marked by mass rootlessness,[14] perceived in the growing concern with panicked, depressed, and drug-consuming populations.

Critique of prohibitionism

Amid this widespread sense of rootlessness, it is worth noting that prohibitionism does not halt drug circulation but instead damages the social fabric and collective identity. It is not that people believe "the war on drugs" is the best solution or that they condone police brutality in arrests and killings of AAS and other drug users. Rather, the population has been led to believe that there is no alternative.

In this context, the argument supporting the "war on drugs" – through prohibitionist public policies that result in the massacre of groups accused of drug use – need not be credible. Nonetheless, conservative thinkers continually reinforce the narrative that any form of drug regulation, as an alternative to prohibition, would make things worse. In fact, it often seems easier to imagine the end of drugs worldwide than to believe that capitalism would confront the determinants that produce and exacerbate suffering associated with drug use.

The war on drugs has generated significant harms for people who consume AAS, primarily through criminalization and stigmatization that exacerbate marginalization and reduce access to health and social services. Punitive policies often lead to increased secrecy and risky behaviors among users seeking to avoid detection, which in turn elevates health risks, including unsafe injection practices and untreated side effects. Furthermore, inconsistent enforcement and the moral judgment embedded in war on drugs approaches fail to address the complex motivations and social realities underlying AAS consumption, inadvertently contributing to social exclusion, poorer health outcomes, and the perpetuation of stigma rather than reducing drug-related harms. Health-oriented, nonjudgmental approaches are therefore critical to mitigate these negative social consequences.

In contrast to the war on drugs paradigm, harm reduction (HR) is recognized as an effective and humane public policy approach when compared with punitive models. Unlike the war on drugs, which focuses on criminalization and abstinence, HR prioritizes reducing the negative health, social, and legal impacts of drug use, while respecting human dignity, autonomy and improving public health outcomes without requiring cessation of drug use. Countries that have implemented HR strategies, such as the Netherlands, Canada, Portugal, Germany, and Brazil, provide strong evidence of their benefits.[5-7]

Specifically regarding AAS consumption, studies and healthcare experiences in the Netherlands, Australia, and Norway highlight the need to expand health responses guided by HR, education, and nonjudgmental, evidence-based information, through specialized care and supportive interventions that improve health outcomes and respect the autonomy.

Critique of extreme relativism

The individualist discourse of autonomy ignores the fact that decisions are only possible within constraints

imposed by capitalist alienation and objective conditions. The fitness and supplement industry promotes the idea that bodily transformation is solely a matter of individual effort. It is worth noting the influence of the prosperity theology model on modern subjectivity – within which the fitness industry fits seamlessly: “The ideology of ‘blame the victim, praise the winner’ in modern times is a type of secularized and individualized covenant theology, associating worldly success and failure with moral virtue” (p. 525).[15] Failure is framed as a character flaw, a logic extended to drug users who, by choosing drugs, are seen as failing and, if they do not overcome this individually, as doing so due to a character defect or illness.

This social atomization and individual guilt – against a backdrop of mass rootlessness – foster disbelief that another society is possible, while producing individual exhaustion and political impotence.[16] Every disadvantage or obstacle is interpreted as a unique problem, channeling the will to change toward one’s own body, effort, and guilt, and giving rise to rapid-response businesses, such as the “beauty chip,” online courses, coaching, miracle cures, and mindset-change merchants.

These quick-fix businesses – reminiscent of indulgence sales in the Middle Ages – minimize authentic decision-making by ignoring the historical and social aspects that shape choices.[17] Process cultural appropriation may help individuals achieve self-regulation – such as planning, organizing, and controlling their behavior – developed over time through internalization of cultural tools. Internalizing symbols and meanings and transforming them into concepts enables new connections and generalization, potentially transcending impulsive and immediate behaviors in favor of affective, cognitive, and volitional processes. Recognition what affects us is fundamental for identifying our needs, allowing us to act consciously. Understanding the various motivations that shape our decisions helps clarify our goals, which do not rigidly or predictably link thought to action. Hence, there exists a gap between decision and action – a gap mediated by feelings, acquired knowledge, tools, and the ability to use them.[11]

HR as an effective and humane response for HED

What can be proposed as a response to HED-related problems? While there’s no universal answer, an evidence-based path emerges from the critiques developed in this essay: HR constitutes the theoretical, ethical, and political framework for addressing drug use. Not merely as a technical approach, but as a social movement that rejects drug criminalization and defends human rights, HR recognizes the complexity of drug consumption, refuses to reduce it to pathology or moral choice, and proposes contextualized responses grounded in care and built in collaboration with people who use drugs. Such responses exist in dozens of countries, including substance testing (to avoid adulteration), dosage and safer-use guidance, access to stigma-free health services, the creation of support networks, and the fostering of supportive relationships.[18]

From its origins, HR has pointed towards collective projects that challenge prohibitionism and individualizing responses. Notably, in some cases, HED consumption does not immediately provoke moral judgment; at times, the spectacularization of appearance leads to peer recognition, as displaying a muscular body is automatically associated with success. Unlike crack (smoked cocaine) users facing severe social vulnerability, the more radical the AAS use, the greater the social approval that may be reinforced. This specificity is not subtle and must be understood in order to develop effective HR strategies.

Alternatively, we can revisit collective social thinking inspired by the Russian cosmism[19] movement – originally conceived in the early 20th century – which addressed the evolutionary development and future existence of the body and humanity. These ideas carried a refreshing, if revolutionary (though utopian/dystopian) impulse in the face of conservative resistance. Today, particularly through voluntary hormone use or other forms of HED intoxication.[20]

Specifically regarding AAS, over several decades a vast body of knowledge has been collectively produced and shared by users. This knowledge circulates through digital manuals, online forums, instant-messaging applications, social media, and in-person interactions. It is critical to recognize that such knowledge, although not generated in laboratories, is not invalid – indeed, given the ethical limitations that prevent formal studies using supraphysiological steroid doses, the most detailed descriptions originate primarily from this informal, collective source. Thus, HR for HEDs must incorporate empirically circulated knowledge produced by experienced users.

Public HR policies for various drugs in countries such as Germany, Portugal, Spain, and Canada are well established and have been extended to AAS users – for example, through drug consumption rooms, the distribution of educational kits, substance testing services, and access to dignified healthcare.[18,21] Practices organized through the radical protagonism of people

who use drugs represent the most effective response for addressing drug consumption in a mature manner, integrating the individual dimension with group- specific and broader social dimension.[22]

Lastly, it remains open to debate whether "enhancement" is indeed the most precise term for this set of processes, which may- and should- change over time, just as the meaning of being human does.

Final considerations

A critical analysis of AAS consumption through the lens of Public Health allows for a practical projection of HR as the most appropriate response, shifting the concept of drugs away from the conventional framing of "abuse" toward forms of consumption that meet needs for modulation or enhancement.

Despite some differences in form, several key points warrant final emphasis: 1) overcoming the reductionism of viewing AAS use solely as "abuse" or as matter of "individual choice"; 2) developing public policies that address the root causes and social determination of consumption; and 3) strengthening HR strategies that respect user autonomy, positioning people who use drugs as protagonists in the transformations required.

Inspired by Russian cosmism, it is necessary to reinvent collective p projects of body and health represents a pathway toward a society that seeks to welcome and transform, rather than criminalize.

rather than relying on decontextualized solutions. HR, allied to Public Health, is a path for a society that seeks to welcome and transform, not criminalize.

Ethical compliance

This essay is part of the theoretical framework for the Study Of Steroids (SOS), developed at the *Faculdade de Medicina, Universidade de São Paulo*. The study was approved by the institutional ethics committee and registered under CAAE: 77455824.7.0000.0068; # 6.724.322.

The first author is supported by a doctoral scholarship from the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES). Brazilian Ministry of Education.

The authors declare no conflicts of interest

DATA AVAILABILITY

The data underlying this study are available within the article and will be publicly available upon publication.

AUTHORS' CONTRIBUTION

Marcel Segalla Bueno Arruda, Isabel Lopes dos Santos Keppler, Roberta Marcondes Costa and Heitor Martins Pasquim: Conceptualization, Methodology, Investigation, Writing – original draft.

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