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Research Paper

Polydrug use and polydrug markets amongst image and performance enhancing drug users: Implications for harm reduction interventions and drug policy

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ABSTRACT

Background: Over the past two decades, the use of image and performance enhancing drugs (IPEDs) has increased significantly. Once largely confined to professional athletes, IPED use has transcended the elite sporting arena and is now predominantly found among non-elite, recreational gym users. This paper presents research findings from a qualitative study of IPED use and supply in a 'hardcore' bodybuilding gym in the north of England. This article makes an original contribution to the field by providing an in-depth account of the use and supply of IPEDs among this population, demonstrating the intersectionality that exists across IPEDs, diverted medication and both licit and illicit substance use and supply.

Methods: The findings are based on the research team's privileged access to an independent, 'hardcore' body building gym in the north of England. Four fieldworkers undertook overt systematic observations, supplemented by 20 semi-structured interviews.

Results: Amongst this sample of bodybuilders, substance use transcended IPEDs to encompass a much broader cocktail of substances all who used IPEDs concomitantly used diverted medication as a means of negating anticipated side-effects, and over half used illegal psychoactive drugs. Furthermore, virtually all of these substances were available to buy via the gym, through fellow gym members and, at times, staff.

Conclusion: This article draws three main conclusions. (1) We are witnessing a convergence of IPED use and supply with diverted medication and 'traditional' recreational substances. (2) The extensive poly-substance use reported by interviewees in this sample necessitates a review of existing harm reduction advice for IPED users that takes into consideration the full range of substances currently being used. (3) Punitive drug policy reform that aims to reduce IPED markets needs to consider the potential to displace social supply towards more commercially-driven dealing. Harsher drug laws may also risk criminalising and stigmatising IPED users.

Introduction

This paper enhances existing understandings of the intersectionality that exists between Image and Performance Enhancing Drugs (IPEDs)[1], prescription medication and illicit drug use. We commence with a review of contemporary research regarding IPED use and markets, before sketching out the existing knowledge on polypharmacy. In doing so, we assert that, while there is a corpus of research that has begun to document the consumption of IPEDs, diverted medication and recreational drugs, this current knowledge is limited due its reliance on survey data (e.g. Bates & McVeigh, 2016; Begley, McVeigh, & Hope, 2017; Brennan, Wells, & Van Hout, 2017; Sagoe et al., 2015). We argue that further in-depth research is required if we are to fully understand this emergent trend.

Through this paper, we seek to enhance the existing knowledge of polypharmacy among IPED users by moving beyond the existing IPED literature through the provision of a more holistic and in-depth account of polypharmacy. To expound our understanding of the nature and motivations of this polypharmacy, we provide a case study of a bodybuilding gym in the north of England - 'Behemoth Builder Gym'- that

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[1] IPED is a term used to refer to a range of substances that are designed to modify the function and appearance of the body (Bates & McVeigh, 2016). This class of substances includes, among others, anabolic-androgenic steroids, growth hormones, peptides, tanning drugs, and weight loss substances (Bates & McVeigh, 2016; Hope et al., 2013; Jennings et al., 2014).

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utilises ethnographic method. Drawing on data from 20 interviews and field observations, we demonstrate that IPEDs were, for many of our participants, part of an ever-growing repertoire of substances used by 'traditional' recreational drug users. Our findings encompass three distinct elements of observed polypharmacy: the variation of IPEDs used, the use of drugs intended to mitigate the negative side effects of IPEDs, and the concurrent use of illegal psychoactive drugs. In highlighting the breadth of substances used and extensive drug-using repertories we encountered, we go on to discuss the implications for developing public health and targeted treatment interventions, including appropriate harm reduction advice.

Further insight into polypharmacy amongst IPED users is provided in the second section of our findings. Moving beyond the common focus on use, we highlight how intersectionality is also present in relation to drug supply. This is important as the relationship between which drugs are consumed and the availability of drugs in local markets is seldom considered. We illustrate how the supply of IPEDs in a marketplace is intersected by the supply of various licit and illicit substances and diverted medications. We also demonstrate how, within our study site, IPEDs were yet another prohibited commodity to be widely consumed, traded and profited from. We assert that the wide availability and subsequent consumption of this cocktail of substances presents distinctive challenges for the management of drug harms.

We conclude with a discussion of the wider implications of our results for harm reduction interventions and drug policies. In particular, we discuss the implications of these findings for targeted treatment interventions, public health policy and drug policy reform.

Background

Since the late 1980s, the use of IPEDs has increased significantly in the UK (Antonopoulos & Hall, 2016; Bates & McVeigh, 2016; Begley et al., 2017; McVeigh & Begley, 2017). Once largely confined to professional athletes, IPED use has transcended the elite sporting arena and is now predominantly found among non-elite, recreational gym users (Coomber et al., 2015; Hanley Santos & Coomber, 2017; McVeigh, Bates, & Chandler, 2015, p. 2; Van Hout & Kean, 2015). Estimates from the Crime Survey for England and Wales (CSEW) show that use of anabolic-androgenic steroids (AAS) – the most commonly used IPED – has increased from 170,000 in 2001/02 to 356,000 in 2016/17 (Home Office, 2017). Further, as Begley et al. (2017) note, the CSEW is likely to underestimate the actual number of users, with data from needle and syringe exchange (NSE) programmes – which suggests that IPED use has grown at a more significant rate (see, for example, McVeigh & Begley, 2017) – being a more accurate predictor. As a result, the profile of IPED users has also become increasingly diverse (Cohen, Collins, Darkes, & Gwartney, 2007; Kimergård & McVeigh, 2014; Sagoe et al., 2015; Zahnow et al., 2018), and whilst attempts have been made to construct a typology of users (e.g. Christiansen, Vinther, & Liokaftos, 2017), there is a consensus within the literature that this is becoming ever more difficult. Existing research demonstrates that motivations for, and experiences of, using IPEDs are vast (Antonopoulos & Hall, 2016; Hanley Santos & Coomber, 2017; Jennings, Patten, Kennedy, & Kelly, 2014; Underwood, 2017; Zahnow, McVeigh, Ferris, & Winstock, 2017). Whilst literature suggests that the most common reason for IPED use is to build muscle, increase strength and/or lose weight, motivations for IPED use now increasingly include a vast array of other reasons, including: sexual enhancement, skin tanning, healing following injury, and increasing confidence and self-esteem (Bates & McVeigh, 2016; Begley et al., 2017; Cohen et al., 2007; Jennings et al., 2014; Kimergård & McVeigh, 2014; Kraska, Bussard, & Brent, 2010; Underwood, 2017; Zahnow et al., 2018).

In addition to this increase in, and diversification of, IPED users, the supply of IPEDs has also become more widespread, with an ever-increasing range of licit and illicit drugs and supplements available to users (Antonopoulos & Hall, 2016; Coomber et al., 2015; Hanley Santos & Coomber, 2017; Sagoe et al., 2015; Van Hout & Kean, 2015). As some have demonstrated, this has also been facilitated by the growth of the internet and online pharmacies (Coomber et al., 2015; Coomber & Salinas, fc; Hall & Antonopoulos, 2016; van de Ven & Koenraadt, 2017). As a result, individuals now frequently use a diverse range of substances concurrently (Dodge & Hoagland, 2011; Sagoe et al., 2015). This includes the 'stacking' of various AAS, with Testosterone Enanthate, Deca-Durabolin and Sustanon among the most popular varieties of AAS (Antonopoulos & Hall, 2016; Bates & McVeigh, 2016; Kraska et al., 2010); the use of substances to enhance the muscle-building properties of AAS, such as human growth hormone (HGH) and insulin (Kanayama & Pope, 2012; Kraska et al., 2010; Sagoe et al., 2015); and the use of substances to combat the negative side effects of AAS use, such as sildenafil (e.g. Viagra) to treat erectile dysfunction, benzodiazepines to improve sleep, and antioestrogens for conditions such as gynecomastia (Hope et al., 2013; Jennings et al., 2014).

In addition to the above ancillary substance use, numerous studies have reported IPED users' concomitant use of illicit psychoactive substances (e.g. Antonopoulos & Hall, 2016; Begley et al., 2017; McVeigh & Begley, 2017; Sagoe et al., 2015; Van de Ven et al., 2018). Since 2013, annual surveys into IPED use carried out by researchers at Liverpool John Moores University (Bates & McVeigh, 2016; Begley et al., 2017; Chandler & McVeigh, 2014; McVeigh et al., 2015) have continually demonstrated concomitant psychoactive substance use among their sample of IPED users. Whilst reported rates have differed over the four surveys – which is partly due to methodological differences – findings from their most recent survey (Begley et al., 2017, p. 20) show that a third (33 per cent) of their sample had used cannabis within the past 12 months, a quarter (25 per cent) had used cocaine, with one in six (14 per cent) using ecstasy and one in 12 (6.8 per cent) using amphetamine. Importantly, whilst rates of concomitant psychoactive substance use differ markedly between studies (e.g. Hope et al., 2013; Jennings et al., 2014; Kanayama, Pope, Cohane, & Hudson, 2003; Sagoe et al., 2015), IPED users consistently appear to consume illicit recreational drugs at rates far in excess of general populations (e.g. Broadfield, 2017; Substance Abuse & Mental Health Services Administration, 2017). Such diverse polydrug-using repertoires pose a number of risks to users (see Begley et al., 2017), in particular potential adverse psychophysical effects from the chemical interactions from AAS-related polypharmacy (Sagoe et al., 2015, p. 17).

In order to increase the effectiveness of public health interventions for IPED users, it is vital to further recognise their extensive polysubstance use regimens (Evans-Brown, McVeigh, Perkins, & Bellis, 2012; Sagoe et al., 2015). Whilst the extant literature has provided insight into some of these issues, there remains a scarcity of in-depth, qualitative research that explores the nature, motivations and experiences of IPED users, including, but not limited to, their IPED regimes, polypharmacy, and using practices. Furthermore, many of the relevant studies (see Sagoe et al., 2015) do not include illegal psychoactive drugs in their assessment of polypharmacy among IPEDs users. Further research of this type is thus needed in order to develop more targeted interventions to address the public health issues that IPED users present in the UK and internationally (Dunn, Mckay, & Iversen, 2014; Evans-Brown et al., 2012; Hope et al., 2016; Iversen, Hope, & McVeigh, 2016; McVeigh & Begley, 2017; van Beek & Chronister, 2015; van de Ven, 2016). This paper sets out to enhance empirical knowledge and understanding of polypharmacy among IPED users and the intersection of IPEDs, diverted medication and illicit recreational drugs.

One of the means through which we can better understand IPED users' polypharmacy and using practices is to conduct further research into the supply of IPEDs. As van de Ven and Mulrooney (2017) argue, whilst there has been a recent surge of research into IPEDs, the majority of this research has focused on their consumption, largely ignoring methods of supply. Notwithstanding this, there is a general consensus within the existing literature that the supply of IPEDs is – as is often the case with other illicit substances (see Coomber & Moyle, 2014;

Coomber, Moyle, & South, 2016) – most aptly characterised by a social supply model (Coomber et al., 2015; Kraska et al., 2010; Maycock & Howat, 2007; van de Ven & Mulrooney, 2017; Van Hout & Kean, 2015). Social suppliers do not view themselves – and are not viewed by others – as dealers *per se* (Coomber & Moyle, 2014; Coomber et al., 2015) but rather as merely 'helping out' friends or acquaintances. Rather than being commercially driven, social suppliers of IPEDs instead receive status or 'kudos' in return (Antonopoulos & Hall, 2016; Christiansen et al., 2017; Coomber et al., 2015; van de Ven & Koenraadt, 2017). In support of this view, through their study of the IPED markets in the Netherlands and Belgium, van de Ven and Mulrooney (2017, p.7) argue that 'dealing networks … are more likely to consist of friends or "friends of friends", tied together by threads of collective meaning'. The authors posit that relationships between buyer and seller are built upon high levels of trust and mutual respect, with IPED suppliers often educating and mentoring users to reduce the potential harms of IPED use (van de Ven & Mulrooney, 2017, p. 11; see also Maycock & Howat, 2007).

The social supply of IPEDs and, particularly, the mentor-mentee relationship often forged by suppliers and users (see Antonopoulos & Hall, 2016; van de Ven & Mulrooney, 2017; Van Hout & Kean, 2015) serves to safeguard against risks from IPED use by educating novice users on safer drug-using practices. In their research in North East England, Antonopoulos and Hall (2016, p. 707) provide evidence of a known IPED supplier refusing to sell to a novice gym user, as he did not consider IPED use appropriate given his relatively short weightlifting career and lack of adequate diet. This, the authors note, was considered to represent a common approach by IPED suppliers, which is based on a genuine interest in users' health and wellbeing, and which further demonstrates the lack of commercial, profit-driven motives (Antonopoulos & Hall, 2016).

Given its 'socio-cultural embeddedness', and the prerequisite of cultural and technical knowledge to supply IPEDs (Fincoeur, van de Ven, & Mulrooney, 2015; Maycock & Howat, 2007), research suggests that the IPED market exists as a distinct entity, largely separated from other illicit drug markets (Antonopoulos & Hall, 2016; Coomber et al., 2015; Fincoeur et al., 2015; van de Ven, 2016; van de Ven & Mulrooney, 2017). However, the expansion of the internet and the growth of online marketplaces appears to have altered this in recent years. Reflecting on the polydrug-using repertoires of many IPED users (Begley et al., 2017; Hope et al., 2013; Jennings et al., 2014; Sagoe et al., 2015; see above), Antonopoulos and Hall (2016, p. 704) argue that such users 'are the ideal-type of customer targeted by online suppliers who deal in a range of pharmaceutical, performance-enhancing and psychoactive drugs simultaneously'. The authors provide an example of an individual with an extensive polydrug-using repertoire, which included AAS, cocaine, anti-depressants and sleeping pills, who purchased these substances from an online seller. Given the extensive polypharmacy reported by IPED users examined above, it is hypothesised here that we might begin to witness a convergence of these markets, particularly given the extent of user-suppliers often found within supply chains (see, for example, Coomber et al., 2015; Coomber & Moyle, 2014; van de Ven & Mulrooney, 2017).

Support for this hypothesis is offered when considering Fincoeur et al.'s (2015) findings. Examining the IPED markets in the Netherlands and Belgium, the authors suggest that increased law enforcement efforts have deterred social suppliers of IPEDs, who are exiting the market due to the increased risk involved in suppling (Fincoeur et al., 2015, p. 244). As a result, the authors suggest that culturally embedded suppliers are being replaced by profit-driven, commercialist dealers who are more prepared to take risks in supplying IPEDs (Fincoeur et al., 2015). In support of this assertion, the authors draw on research by De Hon and Van Kleij (2005), who identified the presence of a 'new' IPED dealer, 'devoid of the socio-cultural attributes of "minimally commercial dealers"' (De Hon and Van Kleij, 2005 cited in Fincoeur et al., 2015, p. 244). The displacement of social suppliers by commercially motivated suppliers can have a number of significant implications for the IPED market and its users, which includes the loss of expert advice and the increase in supply of poor quality products (Fincoeur et al., 2015; van de Ven, 2016).

Taken together, whilst the literature continues to suggest a dominance of social suppliers of IPEDs and a largely distinct IPED market, due to the above findings, along with consideration of the vast polypharmacy of IPED users, there have been recent calls for further research. In particular, to establish the extent to which commercially-oriented suppliers are entering the IPED market (e.g. Fincoeur et al., 2015) and the extent to which IPED markets have converged with other drug markets. The research that follows provides evidence to suggest that this picture is emerging in some localities, whereby commercially-oriented dealers are supplying IPEDs in a marketplace intersected by the supply of various licit and illicit substances and diverted medications.

Research methods and sample characteristics

The data presented here was collected via an ethnographic study of an independent, non-corporate 'bodybuilding gym' in an anonymised town in the north of England. Privileged access was afforded due to the first author's pre-existing ties to the gym owner (the study's gatekeeper) who was affiliated with a six-year ethnography of illegal drug markets and offending careers (Salinas, 2018; Askew & Salinas, 2018). This longstanding relationship and trust in the research process – including confidence in our assurances around anonymity and confidentiality – afforded a level of openness and insight seldom obtained in such a sensitive research setting.

Four fieldworkers undertook 64 h of overt systematic observations on site, recording conversations and observations via field notes and, in the case of observations, digital photography.[2] The research team brought a breadth of experience necessary to the success of the research, having previously conducted ethnographic studies on drug markets and drug use, or else being experienced gym-goers with an in-depth understanding of the subject area. Ethnographic fieldwork was supplemented by 20 in-depth semi-structured interviews, up to three hours in duration, with: (i) the gym's owner and its duty manager – both of whom were male IPED users and 'commercial' IPED suppliers; (ii) a female personal trainer and IPED user; and (iii) 17 of the gym's male members who were recruited and interviewed directly on site – 16 of whom were IPED users (see Table 1).

IPED use was widespread; staff and member interviewees estimated that between '70' and '99.9' per cent of the gym's total 300–400 membership[3] were IPED users. One interviewee – a semi-professional rugby player – was currently serving an 18-month suspension for doping, while another had used IPEDs to help compete in amateur bodybuilding. However, most interviewees and people encountered directly during ethnographic data collection were non-competitive IPED users i.e. they did not compete in terms of performance (sports such as powerlifting or football) or aesthetics (bodybuilding). Nonetheless, the rigorous training and dietary regimes of our participants meant most were 'serious' rather than merely 'casual' gym-goers.

Findings

The paper's findings are presented in two broad thematic sections. We begin by examining the intersection of drug use among our

[2] The willingness among many of the study's participants to be photographed and filmed exercising, purchasing and using (often via intramuscular injection) IPEDs, provides further testimony as to the level of trust afforded to the research team.

[3] Precise membership figures were unobtainable, as most attendees opted to pay per training session and simply signed-in by hand, with just over 50 individuals paying via a formalised monthly membership system.

Table 1
Interviewee descriptors.

Name	Age	Sex	Age Commenced Training*	Age Commenced IPED Use**	Role(s) within 'Behemoth Builder Gym'
Cesar	33	Male	21	24	Gym owner, gym manager, commercial-IPED supplier
Bernard	21	Male	15	18	Gym staff, duty manager, commercial-IPED supplier
Sandy	33	Female	14	31	Gym staff, personal trainer
Al	45	Male	15	42	Gym member
Apollo	35	Male	26	27	Gym member
Billy	23	Male	20	22	Gym member
Carl	24	Male	16	18	Gym member
Cass	25	Male	21	23	Gym member
Don	28	Male	25	Non-user of IPEDs	Gym member
Floyd	29	Male	22	25	Gym member
Frank	35	Male	34	34	Gym member
Gaz	21	Male	17	19	Gym member
George	27	Male	17	20	Gym member
Jay	28	Male	17	20	Gym member
Logan	35	Male	*Unknown*	24	Gym member
Luke	28	Male	18	18	Gym member
Mickey	20	Male	13	18	Gym member
Mo	24	Male	14	23	Gym member
Rick	34	Male	29	29	Gym member
Roy	28	Male	21	23	Gym member

* Whilst this is the age when participants first started training, many explained that they had taken periods of time off training, or had only started training 'properly' or 'seriously' in the last few years.

** Likewise, while this represents the age at which participants first used IPEDs, some participants explained that they had taken extended breaks from use.

participants before turning our attention to the intersection of the associated markets.

Intersection of substance use: polydrug-using repertoires

The data presented below illustrate the breadth of substances used by the study's participants. Sagoe et al. (2015) identified 13 classifications of substances used by anabolic-androgen steroid (AAS) users; however, for the purpose of our analysis, we have subdivided polypharmacy into three broader classifications based on their primary functions: (i) drugs with an aesthetic function; (ii) drugs with a medicinal function; and (iii) drugs with a psychoactive function.

Drugs with an aesthetic function: combinations of, and oscillations between, IPEDs

The IPED repertoire of many participants was extensive, and individuals often switched between different IPEDs over time and across cycles. In support of existing literature (Antonopoulos & Hall, 2016; Bates & McVeigh, 2016; Kraska et al., 2010; McVeigh et al., 2015), all bar one of our user-participants reported the concurrent use ('stacking') of various varieties of AAS – both oral and injectable. Across our sample, there was no standardised stack, ratio or regimen of IPEDs, with the choice of item(s), and frequency of use, dependent upon a range of factors, including: the physiological outcome they hoped to achieve (e.g. cutting, bulking,[4] etc.); recommendations from other, more experienced users, including gym staff and members; the desire to locate a brand or combination/ratio that best suited their own particular metabolic or physical characteristics; and/or the availability of items through their supply channels. As one IPED user noted:

> I like a lot of Trenbolone, Acetate Propionate, stuff like that because you get a little bit of size, you get some hardness, you stay lean and strong. I'm not really a fan of your Deca [Durabolin] and your Sust [anon] to give you size. Don't get me wrong, I've taken them all… [I'm currently taking] BDT… Boldenone, Decanoate and Test – I up that [dosage] with a Test Max 450, which is just testosterone… [I'm] taking a mil of each… in one syringe, then about 2 mil of Sustanon in a separate syringe… [I'm taking that] every three days. And then just the tablets… Oxymetholone Naps… They're 50 mil tablets…. [After the current cycle I'm taking] two months off [IPEDs] then… the whole course will change… I'll be on the Tren, the Blends, the Clomid and the Anavar and the Winstrol, just to cut-up for the summer.
> *Floyd, gym member*

Another interviewee similarly recalled an ever-changing combination of items used:

> I try to change [IPEDs], I try to try something new. If something works, that's cool and I'll remember it works and I'll try use that with something else. But I'm always going to try something to advance [my gains]… [My last IPED cycle] would've been Test 400 and Deca [Durabolin] 300 – both are injectable… Oh and Nap 50 s [Oxymetholone] as well… They're oral tablets. [I've also used] Dianabol [Metandienone]; Winstrol [Stanozolol]; Naps; Halotestin [Fluoxymesterone] – that's nasty stuff… [I] had a little dabble with that…; Sustanon; Test Enanthate; CYP [Cypionate]; Tren[bolone]; Deca [Nandrolone Decanoate]; Equipoise [Boldenone Undecylenate].
> *Luke, gym member*

Many in our sample reported the use of human growth hormone (HGH), Melanotan (a synthetic hormone used to darken skin pigment), "fat-burners" or diuretics (including Clenbuterol, T3s, T4s, T5s, T9s) in conjunction with AAS to enhance their aesthetic appearance. Two interviewees used insulin for image and performance enhancement; however, most interviewees appeared concerned about the potential hazards of this item, citing the death of a fellow gym member a year earlier (as referenced by several interviewees). As one 10-year IPED user noted, "There's three lads doing it in here now… we're trying to tell them [not to use]… it'll turn you diabetic if you take the wrong dose" (*Logan, gym member*). Only one IPED was universally shunned: Synthol – a site enhancement oil that temporarily increases the volume of a muscle – an item described as "dirty" and a "cheat".

Fieldworkers observed members and staff openly injecting themselves or others on the gym's premises: in the changing room, the sunbed area and, most commonly, the staff office. IPED use was not merely condoned in this setting, but was instead actively facilitated and supported by the gym and its staff members. Disinfectant wipes, sterile

[4] 'Cutting' refers to the aim of losing fat; 'bulking' refers to the aim of gaining muscle or general 'size'.

water and 'sharps bins' for the disposal of used needles were accessible from the gym and were provided and disposed of by a local harm reduction service.

Drugs with a medicinal function: counteracting negative side-effects

Beyond the varying combinations of IPEDs outlined above, interviewees also reported the concurrent use of ostensibly medicinal drugs as a means of counteracting negative effects they were experiencing (or anticipating) from AAS use (see Table 1). The negative effects reported by these AAS users are widely documented within the literature (e.g. Hope et al., 2013; Jennings et al., 2014; Sagoe et al., 2015) but included, among other things, insomnia, erectile dysfunction, and gynecomastia (sore/swelling nipples/breasts). A number of interviewees exemplified this:

> You'll be taking steroids and then you'll be taking all the things to counteract other things that are going wrong… You don't realise how much you're actually taking; you're not just taking steroids, you're taking loads of other things as well.
> *Sandy, gym personal trainer*

> A bit of Tren[bolone] it raises your body temperature… [I] can't fucking sleep with it at night… I still get it now [during the daytime, when using] – sweating, like fuck… I go through… Valium… if I ever need them [to aid sleep].
> *Apollo, gym member*

> hCG [human chorionic gonadotropin] – I'll have that once a month which helps prevent your sex drive from dropping. You can use stuff like Proviron [Mesterolone] as well… From a young age [and as an IPED user] I got – *not addicted* – but I used to have to take Viagra all the time [as a result of steroid use].
> *Bernard, gym duty manager*

It is noteworthy that several participants also reported using cannabis as a primarily medicinal supplement to AAS use (Table 2):

> I'm on the juice [AAS], so I'm a little bit more touchy… I've gone to smoking weed… and I have found that it has actually helped relax me and I do think it goes well with steroids… [Smoking it] just brings me down, calms me down to a mellow [state]. When you feel like your head's gonna go [through anger/agitation], you just have a joint to chill out.
> *Carl, gym member*

> I'll have a joint every now and then if I really can't sleep [due to the IPEDs].
> *Logan, gym member*

> I smoke weed at night and I take diazepam sometimes because Tren [bolone] fucks my sleep up.
> *Cesar, gym owner*

Among the IPED users with whom we spoke, *all* indicated the use and necessity of these medicinal drugs concurrent to, or immediately following, an AAS cycle, particularly anti-oestrogen items such as Tamoxifen and post-cycle treatments such as hCG. Barring the use of Viagra (used as a sexual enhancer) and Diazepam (used as a sleeping aid), the use of AAS almost always preceded the use of these medicinal drugs.

Drugs with a psychoactive function: concurrent recreational drug use

As with previous studies (e.g. Begley et al., 2017; Hope et al., 2013; Kanayama et al., 2003; Sagoe et al., 2015), polysubstance use was common among our sample, with over half of participants reporting the use illegal psychoactive drugs alongside IPEDs. The most common psychoactive substances used concurrently by this cohort of IPED users were cannabis, cocaine and ecstasy. Barring the use of cannabis, which some used on a daily basis, reported psychoactive drug use was generally recreational and intermittent. Nonetheless, there was evidence of some high-risk patterned behaviour among several of the gym members. For instance, a seven-year user of IPEDs, aged 28, described to us his use of substances:

> I've been flat out [using IPEDs] for seven months [Decanoate, Testosterone and Sustanon], there's been about a week or two on about four occasions where I've not done them… [But I also] like to 'play' on weekends… I'm like a monster, a proper monster. I'll sniff up to a quarter [ounce of cocaine] most weekends… I'm going out [to bars and nightclubs] with cocaine charged up and I'm going out drinking at least 10–15 double vodkas [50 ml measures each] and whatever else – pints [of beer] and whatever else… MDMA, get on the 'Mandy' and that sometimes… Then I go back to mine and then it'll be another double vodka.
> *Carl, gym member*

This interviewee was not the only one to demonstrate particularly high-risk patterns of drug consumption. Another interviewee used cocaine daily and had sought treatment for what he considered to be dependent use. Furthermore, two gym members encountered via ethnographic fieldwork were IPED users who smoked cannabis throughout the day, including before gym training, and reported intermittently using ecstasy, cocaine and, most notably, crack-cocaine.

Intersectional drug use: summary

The data indicates extensive drug-using repertories among our participants, including ever-changing regimens of IPEDs, medicinal drugs intended to mitigate their negative side effects, and, for over half of the interviewees, psychoactive drugs. Generally speaking, drug using repertoires followed a liner pathway, beginning with illegal psychoactive drugs, followed – often years later – by IPEDs and diverted (or counterfeit) medicinal drugs. Such findings may challenge heuristic assumptions of dedicated gym-goers insofar as the self-administration of so many drugs runs somewhat contrary to healthy or 'clean' living. Nonetheless, these findings corroborate a trend identified in larger surveys regarding relatively high rates of polypharmacy among IPED users (e.g. Begley et al., 2017; Brennan et al., 2017; Sagoe et al., 2015) and provide qualitative insight into the motives and patterns of such use. In sum, this section has demonstrated that many of those frequenting 'Behemoth Builder Gym' used a range of drugs for either an

Table 2
Substances used for countering the negative side-effects of IPEDs.

Substances	Function(s)
Tamoxifen, Nolvadex, Letrozole, Arimidex	Control/counter the body's over-production of oestrogen
HCG and Clomid (clomiphene)	Help restore or 'kick-start' the body's own production of testosterone post-AAS course
Viagra	To counter erectile dysfunction or lull in libido
Cannabis, Valium, ZMA (supplement containing zinc monomethionine/aspartate, magnesium and vitamin B6), '*Sleep Ease*' (Diphenhydramine Hydrochloride) or Diazepam	To aid sleeping and counter the 'buzz' felt from some steroids.

aesthetic, medicinal or psychoactive function. The gym thus provided fertile ground for those able and willing to supply the evident demand for these controlled/regulated drugs – it is here, to the intersection of these markets, that we now turn our attention.

Intersection of drug markets: the gym as a trading bazaar

'Behemoth Builder Gym' provided a physical and social arena through which members could source many of the aesthetic, medicinal and psychoactive drugs listed above. Here, we provide an overview of the observed market(s) subdivided into three thematic subsections: (i) the supply of IPEDs and medicinal drugs by the gym; (ii) the supply of IPEDs by gym members; and (iii) the trading of illegal psychoactive drugs. In essence, this section describes how the gym functioned as an illicit bazaar among its staff and members and, in so doing, illustrates the extent to which legally controlled drugs were readily accessible to those frequenting this environment.

The supply of IPEDs and medicinal drugs by the gym's owner/management

For almost a decade, the gym's owner and its duty manager had jointly facilitated sales of IPEDs and medicinal drugs to many of its members. Indeed, all except two of the 16 IPED-user interviewees ranked the gym as their primary, though not necessarily exclusive, source of IPED-related supplies. The vast majority of IPEDs listed by our participants were available for purchase directly from the gym, including various types of oral and intravenous AAS, HGH, melanotan, fat burners, diuretics, and insulin, as well as medicinal items including: post cycle treatments, anti-oestrogen items, sleeping aides (namely Diazepam), and 'Viagra'. The brazenness of this trade was evident from field observations: customers entered the gym's admin office, spoke openly and unguardedly about IPEDs or medicinal drugs with the gym's members, owner and/or duty manager, browsed items on sale (all of which were stored on site) and handed over money in exchange for their chosen good(s).

Motives for supplying IPEDs were complex. On the one hand, the gym's owner and duty manager may be viewed as culturally embedded within the body-building scene, and both spoke passionately of their desire to help members attain their training goals, which ranged from weight loss and toning, to competitive strongman and body-building events. In addition to providing access to the gym and supplying the 'gear', they provided members with an array of 'supplementary services' (see Fincoeur et al., 2015), including guidance on exercise and training, nutrition, IPED regimens, treatments for AAS side-effects, and post-cycle treatments. Though some interviewees were somewhat sceptical of the prescriptive advice given to members (e.g. what PCTs to take, at what dose, and for how long) many evidently saw this as sage advice and bought whatever drugs came recommended:

> Interviewer: What about the Rip Blend [you're currently taking]… Do you know what's contained in them?
>
> Cass: No… I think it says on [the packaging] what's in them, but I don't ever look.
>
> Interviewer: So you take whatever they [owner and manager] give you?
>
> Cass: Yeah.
>
> Interviewer: And where do you source your information on cycling?
>
> Cass: The gym.
>
> Interviewer: Just the gym?
>
> Cass: Yeah.
> (Cass, gym member)

However, the adoption of multiple roles – including mentor, (unqualified) nutritionist, physician and, crucially, pharmacist (i.e. supplier) – carried with it possible conflicts of interest.[5] This is because the gym's primary source of revenue – estimated by the owner to be roughly £1500 a week – came from the sale of IPEDs and medicinal drugs (e.g. hCG). These sales were an intrinsic component of the gym's business model and indeed of greater commercial necessity than other revenue streams such as legal supplements (e.g. protein) and membership fees. This juxtaposition is evident in the following quote, in which the gym owner makes explicit reference to the gym's financial dependence on IPED sales:

> Quite frankly, this gym wouldn't be worth having if it didn't sell 'gear'… At the end of the day I'm a businessman and sometimes I have bought stuff that's not the best. I'll say to my mates and my members, "Look, it's not the best but it's cheap". And sometimes they'll still buy it.
> *Cesar, gym owner*

As the excerpt demonstrates, the gym owner was willing to supply stock he judged to be substandard *if* consumers were content using it, viewing himself, first and foremost, as a businessman. Similarly, the gym's duty manager alluded to simultaneous motives, indicating a desire to support members achieve their goals whilst ensuring repeat custom:

> All the lads who come to the gym, you want them to look good, you want them to come back to you for more so you want to give them the best ['gear']. You're not going to give them the shit stuff. You want them to spend their money. You want them to come back and look good.
> *Bernard, gym duty manager*

Again, with his desire to give his members a quality service, the duty manager might be viewed as a 'minimally commercial' supplier; however, when considering that this desire was fuelled by a need for repeat customers, this suggests a more direct economic motive. In short, though the gym owner and duty manager were motivated to deal for both socio-cultural and economic reasons, financial imperatives were of paramount importance.

Gym members as 'social' and 'minimal-commercial' IPED suppliers

The supply of IPEDs was not the sole domain of the gym's owner and duty manager. Several gym members bought IPEDs from the gym and resold these items to friends for no profit, thus falling into the category of social supplier (c.f. Coomber et al., 2015; Kraska et al., 2010; Maycock & Howat, 2007; van de Ven & Mulrooney, 2017; Van Hout & Kean, 2015). One gym member explained his reasoning for supplying IPEDs to a work colleague:

> There's a lad where I used to work. He wanted steroids… [He told me] "It's up to you, I can either get them from you, and you can help me [inject] or I'll get them from someone else and let them do it"… I didn't want anybody to fucking just sell him any shit and do fucking anything to his head, so I was like "Fair enough, I'll get it you and I'll do your jab [injection] for you".
> *Apollo, gym member*

Other gym members had bought wholesale at discount cost from the gym and resold the items at a mark-up to outsiders (non-members) and were thus considered 'minimal commercial suppliers'. This practice and its (at least partial) financial motive was less common than that of social supply – "there's only about seven lads in here, at most, who make money from selling on my stuff" (*Cesar, gym owner*). One interviewee

[5] Parallels may be drawn with the United States' pharmaceutical trade, where doctors had previously been incentivised to prescribe certain forms of pain relief drugs (Quinones, 2015).

described how he initiated such sales:

> I always try and get people on the gear [*laughs*]. I sell it myself so I'm like "Get on this". They're always like "Ah, you look fucking well, look at the size of you". And I say "You could be like this too, I've got some stuff for you".
> *Roy, Gym member*

There was also indirect evidence of unsanctioned sales undertaken by some gym members on the premises, as this interviewee eluded to:

> There's a couple of guys who sell it here… A lot of the Eastern Europeans that come here come and sell it…. They're renowned for getting really good stuff apparently.
> *Don, gym member*

Our data indicates that a far broader range of actors were involved in the IPED trade beyond simply the owner and duty manager. Though a small number of gym members profited financially from buying and selling "like 10 bottles at a time and selling them to other people from other gyms" (*Luke, gym member*), most were social suppliers 'sorting friends' in their social networks for no profit.

The market for psychoactive drugs and other criminal items

'Behemoth Builder Gym' also functioned as a site through which informal, often illegal, deals were arranged or facilitated. Whilst members bought and sold a range of goods[6], the primary commodities being traded were illegal psychoactive drugs. Interviews and field observations indicate that a number of gym members sold illegal psychoactive drugs, including cocaine, ketamine and cannabis. They operated as 'closed market' drug dealers, supplying drugs to people within their social networks, including to fellow gym members who were often considered friends. Illegal psychoactive drugs (barring cannabis) were forbidden from the gym's premises, yet individuals could still establish customer contacts or arrange deals at the gym.

> I sell a lot of weed [cannabis]… A few of the lads here [in the gym] buy from me – [they're] mates of mine really.
> *Billy, gym member*

> You'll get some here asking [for cocaine] every now and again… I've never sold anything actually in the gym. I don't even take it with me into the gym when I'm training… [but] I dropped off [cocaine] to [three cocaine customers and fellow gym-members] last week.
> *Ralphy, gym member, fieldwork encounter*

> When I used to sell [cocaine] big fuckin' time [as a wholesaler] I had a few of my members getting it from me [lists several gym members] … Lots of people I know have had something 'on the side' at some point or another… There's a few here now selling bits and pieces.
> *Cesar, gym owner*

Gym members appeared reticent and more guarded when discussing the supply of illegal psychoactive drugs – at least when in the presence of our researchers. During fieldwork, we observed the use of coded language indicative of drug sales – "When do you want that green paint [cannabis] dropping off? Still a full one [*unknown unit*] you're after?". Such subversion was not employed when members and staff discussed, bought or sold IPEDs, indicating a disjuncture between how individuals ranked social (stigma) and legal concerns for these drugs. This point is of significance for the ensuing discussion.

It is notable that the gym's very inception was dependent upon criminal revenues earned from the 'traditional' illegal drug trade. As alluded to in the previous quote, the gym's owner had successfully wholesaled cocaine for several years. Revenues from its sale (as much as £3000 net profit per week) had provided the capital necessary to establish, keep afloat and develop the gym as an ongoing business during its early (and financially turbulent) years. When the opportunity emerged, he transitioned from selling cocaine to IPEDs and related medications. This, he noted, was significantly less risky than selling other illicit substances:

> I'm doubling my investment on loads of the stuff… It's mad, I'm selling to that many people… [It's] much safer than selling coke… [IPEDs are] not a priority for the police and it's harder for them to try prove I'm selling [IPEDs]: we'd just say it's all ours – me, [the duty manager], me mates – and just tell them we're storing it here so it's away from our missus [sic] and families… It's not illegal to have it for your own use [unlike cocaine].
> *Cesar, gym owner*

Though far less pronounced, the trading of illegal psychoactive drugs was facilitated indirectly by the gym. Illegal psychoactive drugs do not appear to have been sold directly on the gym's premises, yet the fraternity that existed among the gym members provided an abundance of social contacts through which closed market drug dealing could occur outside of these premises.

Intersectional drug markets: summary

As this section has demonstrated, 'Behemoth Builder Gym' was more than merely a functional space for physical exercise. It acted as an 'entrepreneurial area' (Hobbs, 1995, p. 114) through which the commercial or social supply of drugs could be undertaken. As such, the gym functioned in much of the same way the traditional British pub once had (Hobbs, 1995): it provided a social setting in which a predominantly male clientele essentially 'hung out' away from occupational or familial commitments, and it helped facilitate an expansive, seemingly fraternal, social network through which the demand for illicit goods could be met. The three broad categories of drugs discussed here – namely IPEDs, medicinal and psychoactive drugs – were all readily accessible to those who frequented this environment. The centrality of IPEDs and medicinal drugs – both in terms of its use and trade – cannot be overstated. In contrast, the trade in illegal psychoactive drugs was somewhat subverted and not directly tied to the gym's core business, though nevertheless present.

Discussion and conclusion

IPED users and markets are often depicted in the literature and policy discussion as distinct entities, as outliers from traditional illicit drug-using populations and supply markets (e.g. Antonopoulos & Hall, 2016; Coomber et al., 2015). The findings presented here challenge this discourse by elucidating the intersectionality that exists across IPEDs, diverted medication and illicit substance use. The use of substances amongst this sample of body builders transcended IPEDs to encompass a much broader cocktail of substances. An estimated 70 per cent of the gym's 300–400 members used IPEDs. Among our sample, all who used IPEDs concomitantly used diverted medication, and over half used illegal psychoactive drugs. Moreover, the use of illegal psychoactive drugs had, in all cases, preceded the use of IPEDs and diverted medication. The IPED users in our sample were thus not a distinct drug user population, but should be more appropriately viewed as 'traditional', recreational drug users whose drug-using repertoires had extended to incorporate drugs that served an aesthetic function.

As many within the field have stressed (e.g. Dunn et al., 2014; Evans-Brown et al., 2012; Hope et al., 2013, 2016; Iversen et al., 2016; McVeigh & Begley, 2017; van Beek & Chronister, 2015; van de Ven, 2016; Van Hout & Kean, 2015), in order to develop more targeted

[6] For example, one fieldworker observed the gym owner purchasing vitamin drinks (*Fortisip*) from individuals whom the manager claimed were heroin users who acquired them weekly on prescription; these were then resold to members. Similarly, fieldworkers observed a couple (non-members) bartering with the gym manager over tools they had ostensibly stolen and were trying to sell him.

interventions for IPED users, it is necessary to gain a better understanding of their polypharmacy and using practices. The uncovering of the extreme polysubstance use documented through this paper is significant and necessitates a review of existing harm reduction advice for IPED users that goes beyond advice on safe injection practices and takes into consideration the full range of substances that IPED users may be consuming. It is not yet known what the potential health implications are from such extensive drug-using repertoires nor of the chemical interactions these drugs have upon one another (Sagoe et al., 2015).

Intersectionality was also present in relation to drug supply, with many participants sourcing substances via the gym owner, duty manager and gym members. IPEDs, diverted medication and illegal psychoactive drugs were all readily accessible to those attending the gym. Our findings indicate that 'Behemoth Bodybuilder Gym' acted as a focal point for a significant proportion of members' social interactions and – in doing so – functioned as an informal trading bazaar insofar as these otherwise illegal (or, at the very least, deviant) transgressions were largely accepted, indeed normalised, within this environment. The gym was as much a space for leisure and for socialisation as it was a space to hone one's physique. Given that much of the broader drug trade is predicated on informal arrangements between friends and friends-of-friends (Lader, 2015; Substance Abuse & Mental Health Services Administration, 2010, p. 28), it is perhaps unsurprising, then, that individuals utilised social networks facilitated by the gym to source and supply these illegal drugs. This symbiosis between supplier and consumer necessitates a closer assessment of IPED markets. The accessibility of such an array of drugs within this social environment is likely to have direct bearing on the polypharmacy observed among the gym's members. This is partly because opportunities to use drugs increase correspondingly with their availability (Bennett & Holloway, 2007 p. 256-7).

Our study contributes to knowledge regarding the evolution and displacement of market actors in response to the opportunities, costs and benefits associated with illegal drug supply (see Aitken, Moore, Higgs, Kelsall, & Kerger, 2002; Garzón & Bailey, 2016). Fincoeur et al. (2015) demonstrate the movement of 'minimally commercial' suppliers out of the IPED market in response to heightened risks from targeted law enforcement efforts. They hypothesise that 'as the [IPED] market becomes more lucrative and subject to increasing attention from the authorities, minimal commercialist dealers are being replaced by more overtly criminal types driven by profit, willing to take risks' (Fincoeur et al., 2015, p. 244). Our case study corroborates this assertion, and demonstrates the movement of a commercially-oriented, 'traditional' drug supplier into the IPED market. As noted elsewhere (e.g. Fincoeur et al., 2015; van de Ven, 2016), the displacement of culturally-embedded suppliers by commercially-oriented suppliers carries with it a number of risks, which includes the loss of expert advice and the increase in supply of poor quality products. This is particularly problematic when considering the conflict of interest of the gym owner as evidenced through this paper.

This study also provides a more nuanced insight into the motivations of 'traditional', commercial drug dealers entering the IPED market that extends beyond simple profit-making opportunities. For the gym manager in this study, whilst the decision to supply IPEDs was, first and foremost, commercially motivated, there was an added dimension concerned with the lower risks associated with the supply of these substances in comparison to other illicit drugs. This is considered to be due to current UK classification and sentencing guidelines. In the UK, for example, despite many IPEDs being classified as class C substances, the typical possession offence of up to two years' imprisonment and/or an unlimited fine for a class C substance does not apply under the 1971 Misuse of Drugs Act. This contrasts with a sentence of up to seven years for possession of class A substance (e.g. cocaine, MDMA) or 16 years for possession with intent to supply (Sentencing Council: Drug Offences Definitive Guideline, 2012).

This finding also raises important questions for policy in the face of more punitive approaches to IPED use being adopted in other jurisdictions. For example, in Queensland, Australia, anabolic steroids were rescheduled in 2014 as a schedule-one substance to sit alongside other substances such as crystal methamphetamine, cocaine and heroin. The potential punishment for intent to supply is up to 25 years' imprisonment. However, increased scheduling aimed at deterring drug dealers and organised crime invariably carries increased sentences for possession, therefore potentially criminalising a growing number of otherwise law-abiding IPED users. Increasing punitive sanctions toward IPEDs will likely heighten the stigma associated their use which could result in fewer IPED users accessing treatment. In light of the potential for harm that exists with such a plethora of polysubstance use exemplified in our study, the potential negative effects of reclassifying IPEDs needs to be considered.

Finally, a note on methods. The ethnographic nature of this research project illustrates the utility of this methodological approach that goes beyond existing knowledge generated through quantitative methods (Bates & McVeigh, 2016; Chandler & McVeigh, 2014; McVeigh et al., 2015). The discussion of the gym as a place to go to after work and before going home presents the gym as a prominent site for socialisation and relaxation, performing similar functionality and purpose as the traditional English public house. The rich data presented here in this traditional gym setting underscores the importance of physical social settings. As Hobbs (1995, p. 106) has observed in reference to criminal entrepreneurship: 'These arenas support instrumental networks that function as enabling environments for a plethora of money-making opportunities, some of which will be either partly or wholly criminal'. With this in mind, we assert that scholars should resist the temptation to concentrate the empirical lens solely on the new and novel. Despite the increased prevalence of internet-facilitated IPED sales in recent years (Hall & Antonopoulos, 2016) survey data indicates that less than a quarter of users currently obtain IPEDs via these online outlets (Begley et al., 2017). Social supply networks — such as friends, trainers and 'dealers' — continue to dominate the IPED market. The expansion of the IPED consumer-base, the dominance of social supply markets and the emergence of more commercially minded suppliers warrants further in-depth studies of these ever-evolving markets.

Declaration of interests

None.

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