

24 **Title: Help-Seeking Beliefs Among Anabolic Androgenic Steroid Users Experiencing**
25 **Side Effects: An Interpretive Phenomenological Analysis.**

26 Anabolic Androgenic Steroids (AAS) are hormones that comprise derivatives of testosterone
27 that regulate the development of male sexual characteristics (Aljubori, 2019). A substance
28 can be defined as an AAS through the following criteria: (i) a chemical, or (ii)
29 pharmacological compound that is related to testosterone, and (iii) not an estrogen, progestin,
30 or a cortisol-based steroid (Goldman, Pope & Bhasin, 2018). The anabolic effects of AAS on
31 physiological and psychological characteristics include abnormal fat and carbohydrate
32 metabolism, increases in aggression and attention, and enhanced blood flow and up-regulated
33 muscle protein synthesis (Yu, 2014). As such, AAS are efficacious in increasing muscular
34 size, performance and aesthetics, and consequently, are prevalent in elite sport and
35 professional bodybuilding (i.e., collective estimate of 13.4%; Sagoe et al. 2014). Surprising to
36 most however recreational sportspeople (e.g., non-elite athletes, fitness clients) report the
37 highest prevalence of illegal AAS usage at 18.4% (Petrocelli, Oberweis & Petrocelli, 2008).
38 Therefore, research into this sensitive area has importance for public health providers (Pope
39 et al., 2014).

40 Given their anabolic functions, most countries permit medical prescription and clinical use
41 of AAS for health conditions (e.g., severe sarcopenia), and therefore permit legal possession
42 (Advisory Council on the Misuse of Drugs, 2010). An unintended consequence of this public
43 health strategy has been the increasing public demand for AAS. Further, despite prohibition
44 of AAS in commercial markets, underground sources (e.g., internet) facilitated an increased
45 usage among the general population (Goldman, Pope & Bhasin, 2018). Indeed, a meta-
46 analyses by Sagoe et al. (2014) noted a lifetime prevalence rate of 3.3%, with 6.4% in males
47 and 1.6% in females, with the conclusion that AAS use is a widespread public health concern.

48 Researchers have established that many recreational athletes consume AAS for mostly
49 cosmetic and personal image motives (e.g., improve lean body mass, reduce fat) and many
50 AAS users conduct their own risk-benefit analyses, to the extent that the cosmetic benefits of
51 AAS appear to outweigh the negative health risks (Kanayama and Pope, 2018). In contrast to
52 recreational drugs (e.g., narcotics) typically encountered during adolescence, AAS is a late-
53 onset form of substance misuse (i.e., median=22 years of age) (Karazsia, Crowther &
54 Galioto, 2013). Moreover, Pope et al. (2014) have argued that many AAS users may go
55 undetected, largely because the side effects associated with AAS are considered negligible by
56 many users.

57 When self-administered without formal medical guidance, the use of AAS, especially from
58 blackmarketed sources, poses various physical and psychological risks (Perry and Hughes,
59 1992; Iriarte and Andrade, 2002; Baggish et al, 2010). Existing regulatory efforts have failed
60 to protect consumers by not accounting for the health threats posed by AAS (Goldman, Pope
61 & Bhasin, 2018). Indeed, Aljubori (2019) outlined various physiological side effects ranging
62 from heart hypertrophy to kidney failure, and deepened voice in women, and hypogonadism
63 (i.e., reduced testosterone production) in men. Further evidence (Karazsia, Crowther &
64 Galioto, 2013) suggests that mental health issues (e.g., depression, eating disorders) are
65 associated with AAS use (Sagoe, Adreassen & Pallesen, 2014). It has also been found that
66 AAS users often self-medicate with doses that far exceed medical norms (i.e., from 1000 up
67 to 5000mg per-week), and engage in high-risk behaviours such as needle sharing (Goldman,
68 Pope & Bhasin, 2018). Alarmingly, even when individuals are aware of information
69 pertaining potential health harms of AAS, they often persist with their use (Walker & Joubert,
70 2011; AlFalasi et al., 2008). To reduce engagement with such potentially harmful AAS use

71 and their associated risks, it is necessary to understand the factors underpinning professional
72 help-seeking behaviours among AAS users.

73 The number of AAS users registered with advice services in the UK has increased in
74 recent years, but the majority of users remain reluctant to engage with the available support
75 (Evans, Brown and McVeigh, 2009; Interagency Drug Misuse Database, 2009). For instance,
76 although recreational AAS users are registered with a General Practitioner (GP) as a first
77 point of medical contact, GPs report a lack of help-seeking from AAS users (Lenehan, 2003).
78 Grogan et al. (2006) reported that competitive bodybuilders may not seek help because of a
79 lack of confidence in health professionals' competencies, however this issue has yet to be
80 explored with recreational athletes. Further, there remains a paucity of information on why
81 most users do not seek help when they experience unwanted side effects, and what
82 information and/or treatment strategies they use to self-manage (Yu, Hildebrandt & Lanzieri,
83 2015). Indeed, the widespread availability of black market 'stacks,' that include unregulated
84 substances to self-treat and counteract side-effects, presents further risk to the public
85 (Goldman, Pope & Bhasin, 2018). Hence, there is a need for a research-informed
86 understanding of the psychosocial factors that underpin professional help-seeking beliefs
87 among AAS users (Grogan et al., 2006; Yu, Hildebrandt & Lanzieri, 2015).

88 Given the lack of readily available interventions for populations implementing stigmatised
89 practices in sport and exercise contexts (Breslin, Shannon, Haughey, Donnelly & Leavey,
90 2017; McGuane, Shannon, Sharpe, Dempster & Breslin, 2019), Tamminen and Bennett
91 (2017) advocate as an important initial step, the development of rich information through
92 qualitative methodologies. In particular, Interpretative Phenomenological Analysis (IPA) is
93 a method that entails purposively selecting individuals, and providing participants with an
94 opportunity to describe their unique subjective experience of personal and social phenomena

95 in relation to the topic studied (Smith & Osbourne, 2003; Smith, 2004). Unlike other
96 qualitative methodologies, IPA adopts a person-by-person, idiographic focus, and permits
97 detailed insights on a topic that have not yet been explored (Larkin & Thompson, 2012).
98 Given help-seeking is typically a unique and private experience, IPA can add value to
99 understanding how social, cultural and psychological processes influence AAS use, and
100 subsequent help-seeking behaviours.

101 Therefore, the aim of the current study was to explore AAS use among recreational
102 athletes and/or fitness clients, and specifically delve into the area of professional help-seeking
103 for side effects. We sought to explore three key areas: (i) Users' beliefs regarding the safety
104 of AAS, and the information shared among peers; (ii) the treatments utilised and decision-
105 making processes involved in seeking professional help (or not); and (iii) possible routes to
106 healthcare provision.

107 **Method**

108 **Participants and Procedure**

109 The research was approved by Ulster University Research Ethics Filter Committee. We
110 recruited participants through the Internet and by snowball sampling wherein participants
111 recruited other hard to reach participants. Given the lower prevalence of, and difficulty in
112 recruiting female AAS users outside of the bodybuilding subculture (Kimergard, 2015; Sagoe
113 et al., 2014), only male users were approached for inclusion. Six males from the United
114 Kingdom (n=5) and United States (n=1) agreed to participate (out of 7 approached), which
115 adhered to the idiographic focus within Interpretative Phenomenological Analysis (IPA;
116 Smith & Osborn, 2003). As part of our inclusion criteria we specifically sought recreational
117 fitness clients and non-elite athletes who had experienced side-effects.

118 Following ethical approval the primary investigator (PI) met the participants and
119 outlined the study, highlighting that all responses would be anonymous. Under the guidance
120 of two co-investigators with comprehensive experience in using IPA and qualitative
121 methodologies, the PI collected data through semi-structured face-to-face interviews with
122 each participant, at a convenient time and location.

123 A semi-structured interview guide covering three broad areas was devised to ensure
124 that a systematic line of inquiry was followed with each participant: (i) the experience and
125 beliefs of using AAS, and side-effects experienced (ii) treatments for side effects and
126 continuing/stopping using AAS; (iii) the experience of help-seeking. However, the interviews
127 also ensured flexibility through allowing participants to spontaneously raise issues important
128 to them (Smith & Osborn, 2003). Adhering to an IPA approach (Pietkiewicz & Smith, 2012),
129 the PI conducted the interviews through a neutral and facilitative approach, providing
130 participants with opportunities for reflecting on, and making sense of their experiences of
131 AAS use and help-seeking attitudes/behaviours. Individual interviews lasted on average 60
132 minutes and were transcribed verbatim.

133 **Data Analysis**

134 Participant's accounts were analysed using IPA (Smith, Flowers and Larkin 2009; Smith and
135 Osbourne, 2003). This method employed an idiographic multiple-case study approach to
136 analysis, described by Smith (2004, p. 41) as a process that starts with: (i) "the detailed
137 examination of one case study until some degree of closure or gestalt has been achieved"; (ii)
138 continues with "a detailed analysis of the second case, and so on through the corpus of
139 cases"; and (iii) moves on to "attempt to conduct a cross case analysis."

140 The authors (a sport and exercise psychologist, a Masters of Science student, a
141 professor in health psychology, two PhDs in health psychology, and a General Practitioner)
142 all had prior experience in using qualitative research methods. The PI transcribed each
143 interview, and individually coded the data using close line-by-line coding to produce themes
144 and subordinate themes (Larkin et al., 2006). To ensure quality and accuracy, the following
145 steps were taken to ensure rigour (Tracy, 2010). First, two authors read and reviewed the PI's
146 coded data. The dependability of the findings was apparent in their agreement regarding the
147 themes and sub-themes identified (Larkin & Thompson, 2012). Their findings were then
148 formally discussed and debated among the research team, and cross-examined until
149 consensus was reached. Once analyses was complete, extensive participant quotations were
150 included in the text, such that readers have the opportunity to assess detail and develop their
151 own conclusions (Tracy, 2010). Finally, all authors contributed to the writing and review of
152 the article.

153 **Results and Discussion**

154 All participants were white males aged between 23 and 39 years old, and comprised a range
155 of AAS users including recreational athletes (e.g., rugby) and fitness clients, who held
156 various motives for use (e.g., cosmetic reasons, self-medication for self-diagnosis for low
157 testosterone, gain size for their sport). Participant's use of AAS varied between one period up
158 to current and prolonged use for more than 10 years, with one participant reporting self-
159 manufacturing the drugs from raw ingredients. Participants had all experienced unwanted
160 side effects. Table 1 below shows their demographic and contextual information.

161 *** Insert Table 1 here***

162 Overall, participants accounts were unique, highly contextualised, and detailed
163 support for current evidence that unregulated AAS use can induce harmful physical and
164 psychological side effects (Goldman, Pope & Bhasin, 2018; Aljubori, 2019). Moreover, users
165 tended not to seek, or consider, professional help when presented with side effects,
166 subsequently practicing personalised forms of risk-benefit analyses (Kanayama & Pope,
167 2018), cognitive dissonance, and underground forms of self-treatment (Karazsia, Crowther, &
168 Galioto, 2013). Whilst acknowledging that the present study comprised a small number of
169 participants, and therefore findings are not widely generalisable, the results highlight an
170 important need for, and important considerations in the development of educational
171 interventions for recreational athletes and fitness individuals. Following the idiographic
172 approach to analyses, comparisons between the participants resulted in four master themes
173 developed from the data (i.e., a belief that GP's and medical staff are ineffective; biasing
174 harms and benefits; a subculture in facilitating and sharing information; maladaptive harm
175 minimisation). Each master theme encompassed sub-themes that provided additional detail
176 and insights into the participants individual and collective experiences. An overview of the
177 findings are provided in Table 2, and a detailed summary and cross-comparison with extant
178 literature is provided below.

179 ***Insert Table 2 here ***

180 **Master Theme 1: A belief that GPs and medical staff are ineffective**

181 Various assumptions about statutory health services and GPs embodied both a distrust
182 and lack of confidence in their competencies regarding AAS. It was evident that there
183 was a presupposition that presenting to a GP or medical professional will lead to the
184 participant being challenged to reconsider their use of AAS for legal and health reasons.

185 For instance, only P4 in the study fully disclosed their use to a medical professional, and
186 this was not to their GP, and also not to the first Endocrinologist to whom he was
187 referred to. Healthcare effectiveness hinges on trust and cooperation between patient and
188 consultant (Mansfield, Addis, & Mahalik, 2003), and the perceptions of inadequate
189 healthcare provision and legal stipulations, may therefore hinder levels of professional
190 help-seeking. Such sentiments have also been expressed by professional bodybuilders
191 (Grogan et al., 2006), and elite athletes (Kanayama & Pope, 2018), and this is one of the
192 first studies to establish such beliefs among recreational athletes.

193 Specifically, participants emphasised the perceived inferior medical knowledge of
194 health professionals in comparison to themselves, or that of their peers. For example, two
195 participants outlined the following negative views of healthcare professionals:

196 *P2: "They have no...idea what's going on, their level of knowledge is laughably*
197 *poor... (with reference to endocrinologists), most will not actually acknowledge the*
198 *role of estrogen in the male body."*

199 *P4: "Doctors are pretty ignorant when it comes to it... I spent the last year dealing*
200 *with urologists and endocrinologists who are idiots. I knew the guy was wrong, so I*
201 *asked for a second opinion. The thing is, any time I've spoken to endocrinologists*
202 *they have referred to a book. I know they can't know everything, but if you have*
203 *been referred to a specialist you want to know the person dealing with you is not*
204 *just picking up some book that any old mong can pick up in a library. I've read*
205 *those, I know all that stuff, I want someone who has practical knowledge of cases*
206 *like these, and the nuances each individual has."*

207 A further subtheme (unwillingness to disclose to the doctor; see Table 2) indicated that
208 participants avoided any formal discussion of the side effects experienced with GPs. By
209 generalising negative views of professional medical staffs' knowledge regarding treatments,
210 the participants could be viewed as practising cognitive dissonance. Cognitive dissonance is
211 defined as altering one's beliefs and behaviours to reduce the discomfort associated with
212 conflicting or opposing information regarding one's behaviours (Festinger, 1957). Authors
213 (Newby-Clark, McGregor, & Zanna, 2002) have suggested a link between cognitive
214 dissonance and negative emotions. In respect of our participants, cognitive dissonance may
215 explain why they choose not to disclose to their AAS usage to GPs (e.g., P1 and P4). The
216 findings expressed are reflective of attitudes held by competitive bodybuilders (Lenehan,
217 2003; Karazsia, Crowther, & Galioto, 2013), such that, holding a prejudiced negative view of
218 formal medical support means that seeking professional help is not an appropriate response.

219 Inherent within the cognitive dissonance practiced, many of the participants also expressed
220 an optimism bias regarding their ability to self-manage and consequently mitigate the
221 unwanted side effects without the help of a GP. Within Optimism Theory (Shepperd, Patrick,
222 Jodi, and Meredith, 2002), optimism bias refers to when people view their situation in a
223 positive light and believe they are less likely than others to experience negative effects, and is
224 mediated by increased perceptions of self-control (Shepperd, Patrick, Jodi, and Meredith,
225 2002). In this context, through experiencing personal agency through seeking underground
226 support (e.g., reading web discussion boards, speaking to peers), and then believing that they
227 are more educated than formal medical staff, may have facilitated an optimism bias, and
228 therefore further low levels of professional help-seeking (van Harreveld, van der Pligt, &
229 Yael, 2009).

230 Supporting Optimism Theory (Shepperd, Patrick, Jodi, and Meredith, 2002), P2, P3 and
231 P4 displayed the greatest degrees of self-confidence in their knowledge about AAS use, and
232 concomitant severest side effects (e.g., clinical depression). Such internal biases may have
233 also facilitated a greater risk of underground forms of treatment, leaving users vulnerable to
234 further harm (e.g., users reported taking ‘stacks’ of substances to counteract side effects)
235 (Goldman, Pope & Bhasin, 2018). From a personality-focused perspective, the sentiments
236 expressed by all but one of the participants (P6) regarding their superior knowledge of AAS
237 may also suggest a degree of narcissism among recreational appearance-focused athletes, as
238 is the case in professional bodybuilders (Pawłowska, Zaręba, & Potembska, 2016).
239 Conversely, P6, who experienced a single negative side effect (i.e., heightened aggression),
240 avoided further use of the substances and admitted being poorly educated, and described how
241 he followed his coach’s advice to use AAS because of his self-confessed inadequacies.

242 All participants held the view that disclosure to a GP or medical professional would be
243 met by a verbal reprimand and/or that the GP would patronise or sneer at the patient in this
244 scenario. The colloquialism of “*looking down their nose at you*” was used explicitly by P1
245 and P2, suggesting an anticipated moralising aspect of the clinical encounter. In this view,
246 when GP inquired about their use of drugs, participants felt a prejudiced form of stigma.
247 These findings align with extant research (Yu, Hildebrandt & Lanzieri, 2015) indicating a
248 prejudiced view of AAS users among healthcare providers, when in comparison to their
249 views of other drug users. Indeed, to improve such engagement between the communities,
250 Anawalt (2019) among others (Creado & Reardon, 2019) have emphasised a compassionate,
251 and patient-centred approach from practitioners, such that self-efficacy is encouraged during
252 periods of resistance.

253 **Master Theme 2: Biasing harms and benefits**

254 The side effects reported among our participants support studies (Parkinson & Evans, 2006),
255 indicating that the vast majority (99.2%) of users report harmful side effects from AAS use.
256 In this regard, the second master theme highlighted confirmation bias on the effects of AAS
257 use. Confirmation bias permits a selective attention paid to information which supports a
258 person's beliefs, and the subsequent overlooking of information which challenges a person's
259 beliefs (Lord, Ross, Lepper, 1979). The confirmation bias expressed by our participants was
260 evident in their belief that AAS use was safe, and allowed them to achieve personal goals.
261 For instance, P2 stated that AAS helped him gain education, and encouraged him to maintain
262 an active, healthy lifestyle, whilst also listing sixteen adverse side effects experienced
263 through AAS use. This 'bracketing off' for serious risk factors ensured that confirmation bias
264 is used as a strategy to prevent the discomfort of dissonance (van Harreveld, van der Pligt,
265 and de Liver, 2009). Thus, confirmation bias differs from feelings of ambivalence, in that
266 ambivalence is holding conflicting attitudes towards a subject (Cooper, 2007).

267 In another example of 'bracketing off' potential harms, P2 noted that he suffered from
268 cysts to his liver, yet also mocked the notion of steroids causing liver cancer. Likewise, P3
269 stated that they experienced few serious issues, and confirmation bias appears evident in his
270 self-diagnosis and self-treatment, as indicated below.

271 *P3: "As far as serious issues go I've never really heard of any serious issues and*
272 *it's not like it's something you can overdose on. Unless you get an infection and*
273 *you leave it too long and it goes septic, you are not going to die...There was*
274 *about a three week period where I was lactating, but that cleared up as soon as*
275 *I handled the side effect. Everything I have encountered can pretty much be*
276 *avoided if you know how to handle it."*

277 This biased rationalisation process is again drawn with P6, who stated that he does not:

278 *P6: “do any drugs, and drinks at the most three times per year”*

279 Because participants displayed a sense of control and personal knowledge of AAS,
280 participants displayed confirmation bias regarding their self-categorisation as a sensible ‘*drug*
281 *user*’, rather than an ‘*drug abuser*’. For instance, P2 made the distinction that, while the
282 medical community would stigmatise him an abuser, he would consider himself a responsible
283 user. This perspective is supported in one of the few qualitative studies among recreational
284 athletes (Kimergard, 2015), in which users tend to ignore the potential harms of risky
285 behaviours, and rather, convey their control and strategic risk management. Lastly, all
286 participants expressed a degree of scorn towards uneducated users whom they deemed
287 irresponsible. As such, there appears to be converging evidence that recreational users tend to
288 minimise, or ignore problems and emphasise their ability to cope (Monaghan, 2001;
289 Petrocelli, Oberweis & Petrocelli, 2008; Kimergard, 2015). A biased rationalisation process
290 allows individuals to pursue muscular performance and appearance goals.

291 **Master Theme 3: A subculture in facilitating and sharing information**

292 The participants consistently reported a sense of belongingness to a microculture which
293 transfers knowledge about AAS usage, and sustains beliefs and norms. The presence of such
294 dynamic social processes also aligns with components of Social Identity Theory (SIT; Tajfel,
295 1982), to the extent that individuals practice ‘in group’ hidden attitudes, norms and
296 behaviours, that ‘out groups’ are not privy to. Indeed, studies (Dunn, Mazanov & Sitharthan,
297 2009) have indicated that being acquainted, or friendly with other AAS users significantly
298 predicted future intentions to use AAS. Several participants recommended the documentary
299 ‘Bigger Stronger Faster’ (Bell, 2008) to other users, and cited the documentary as a

300 foundation for their information, and motives to pursue usage of steroids. A common
301 rationalisation for this view, specifically articulated within the documentary ‘Bigger, Faster,
302 Stronger’, is that AAS are not as harmful as other more common substances such as alcohol
303 and tobacco. Indeed, and through a confident demeanour, P1, P2, P5 and P6 all outlined that
304 AAS can be used safely and has many positive medical benefits, with P1 specifically stating
305 that AAS is not in the top 100 of reasons patients are admitted to emergency rooms, whilst
306 alcohol and tobacco rank higher (n.b. the documentary used unadjusted statistics for
307 population usage of AAS).

308 An additional sentiment displayed by the participants was that they belonged to a
309 subculture that held ‘insider’ knowledge with regard to accessing AAS, dosages, correct
310 formulation of ‘stacks’ of substances, and being privy to information that is exclusive to the
311 culture. Our findings therefore support extant evidence among recreational athletes
312 (Petrocelli, Oberweis & Petrocelli, 2008; Kimergard, 2015), indicating a dissemination of
313 private knowledge among experienced and inexperienced users. Further, all our participants
314 cited the internet as a pertinent source of information, and as an accessible way to
315 ‘underground’ markets.

316 Specifically, three participants used the same forum, while one used multiple forums,
317 and cited the benefit that these internet forums ensure anonymity and allow for people to ask
318 questions and receive answers on the use of AAS. Research (Cordaro, Lombardo &
319 Cosentino, 2011) has indicated that unregulated internet sources often recommended doses
320 that are two–fourfold higher than current medical norms, and further work (Clement et al.,
321 2012) has proposed that less than 5% of websites provided accurate health information
322 regarding steroids. Such misinformation among forums and product websites, may have
323 provided our participants with greater perceived knowledge, and therefore a greater risk of

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324 engaging with maladaptive help-seeking behaviours because of optimism and confirmation
325 bias.

326 **Master Theme 4: Maladaptive harm minimisation**

327 The final theme relates to ‘harm minimisation’, which occurred as a maladaptive form of
328 self-treatment and help-seeking. The most pertinent finding of this study is that almost all
329 (5/6) participants attempted to self-treat with other substances following their self-diagnosis
330 of side effects. This maladaptive response to harm minimisation ties further with the control
331 aspect of optimism bias, such that self-diagnosing and self-treating is a further control-
332 seeking behaviour (Shepperd, Patrick, Jodi, & Meredith, 2002). These behaviours
333 demonstrate cause for concern, as the self-treatment of symptoms without medical formal
334 supervision from a medical professional is a risky practice (Cordaro, Lombardo & Cosentino,
335 2011; Clement et al., 2012). Furthermore, a polypharmacy of AAS use with other illicit
336 substances has been found to induce harmful psychophysical effects (Sagoe et al., 2015).

337 Specifically, we found that five of the participants have treated themselves for side effects
338 with substances and methods found illegally on the ‘black market’. Substances ranged from
339 the use of tamoxifen to combat gynaecomastia, to the act of bloodletting through a peristaltic
340 pump to relieve symptoms of high blood pressure and polycythaemia (P2). Critically, at the
341 first sign of trouble, the usual response is self-treat and, failing that, to find someone in the
342 social network to ‘fix’ them, as stated by P6. The following statement by P4 further outlines
343 the maladaptive cycle of information sharing, and underground forms of self-treatment
344 among AAS users, which ultimately exposes them to further potential harm;

345 *P4: “The more convinced you are that you know better, then more likely you are*
346 *to self-medicate.”*

347 In contrast to a qualitative study among recreational AAS users in the UK (Kimergard,
348 2015) none of our participants reported contact with formal harm reduction services. From an
349 intervention production standpoint, existing health harm reduction services have been largely
350 top-down focused (i.e., expert led) rather than consumer-led (Filipe, Renedo & Marston,
351 2017). Importantly, the lack of stakeholder involvement into such interventions can often
352 result in a perceived lack of trust and confidence among potential participants, and thus lack
353 of subsequent engagement, which may have been the case for some of our participants.

354 Non-AAS drugs such as fat burners, and ‘stacks’ that included multiple unregulated
355 substances to counteract side effects, were also consumed by the participants. Our findings
356 thus corroborate a meta-synthesis of existing studies (Sagoe et al., 2015) that highlighted an
357 association of AAS use with other illicit drugs. Several participants also indicated the usage
358 of recreational drugs (e.g., P3), who indicated that while AAS may be viewed as:

359 *P3: “bad...so is the bottle of whisky (I) washed it down with”*

360 Interestingly, the data also revealed some harm minimisation practices which could be
361 considered more adaptive. For example, P5 who was the most reluctant user identified, stated
362 being aware of aggression and irritation during his AAS use, and indicated seeking a greater
363 ability to be calmer by reducing and stopping AAS use. P2 also reported that when he used
364 trenbolone he informed his partner of mood changes, perceived by him as minimising the
365 potential damage to social connections.

366 **Clinical implications**

367 The aims of this study were to understand AAS users’ help-seeking beliefs from medical
368 professionals, and their experience of, support sought, and treatments used for AAS-induced
369 side effects. Findings support recent evidence that AAS use is a widespread public health

370 issue (Sagoe et al., 2014), and existing regulatory efforts have failed to account for the health
371 threats posed by AAS (Goldman, Pope & Bhasin, 2018), demonstrating a clear need for
372 interventions among the present population. Given the small sample size, findings should be
373 interpreted with caution. However, the flexible IPA approach (Smith & Osborn, 2003)
374 yielded valuable and detailed insights which unearthed various novel findings regarding AAS
375 users' beliefs, and may translate into policy, research and clinical practice.

376 Specifically, our findings showed that AAS users who experience side effects are likely to
377 self-diagnose and self-treat, because: (i) they believe that GPs and professional medical staff
378 are ineffective and lack knowledge of AAS; (ii) users' bias harms and benefits of AAS, and
379 practice cognitive dissonance by avoiding situations in which their views can be challenged;
380 (iii) a subculture facilitates and shapes an ill-informed discourse that AAS side-effects can be
381 safely self-treated, and; (iv) unregulated pharmacological forms of self-treatment (e.g.,
382 stacks) are widely accessible through the black market, which are often advocated for by
383 experienced users. Subthemes revealed that the perceived inferior knowledge of the formal
384 medical community is reinforced by pro-steroid information sources (e.g., internet, peers),
385 and builds a greater perceived sense of self-control in line with the theory of optimism bias.
386 This pathway to increased control is further facilitated through the practicing of cognitive
387 dissonance and confirmation bias. These master and sub-themes are interlinked, and all
388 present challenges for the medical profession to overcome.

389 In order to curb the increasing rates of harmful and unregulated AAS use, further on-going
390 government funding and support should be given towards nationwide prevention schemes
391 and AAS awareness training (Evans, Brown & McVeigh, 2009). In this vein, free and
392 confidential screening, and help-seeking advice could be made available through fitness
393 centres, sports clubs, health centres and online mediums (Reardon & Factor, 2010). It is

394 recommended that focus be given towards treatment and prevention strategies in order to
395 disrupt the established negative cycle of AAS initiation and subsequent dependence,
396 withdrawal and relapse (Goldman, Pope, & Bhasin, 2018). Such services could be founded
397 on the optimistic view that most reported side-effects are treatable, and often reversible
398 through existing formal medical care (Anawalt, 2019).

399 Our study, among others (Karazsia, Crowther, & Galioto, 2013), highlighted that the
400 interactions between medical professionals and clients will be crucial to effective delivery of
401 such programmes, to the extent that prejudice to one another is common among both medical
402 professionals AAS users (Yu, Hildebrandt & Lanzieri, 2015). Therefore, from a healthcare
403 systems perspective, we recommend practitioners and clinical health providers adopt a client-
404 centred approach during counselling, education and communication of awareness messages
405 (Crawford, Brown, Kvangarsnes, & Gilbert, 2014). Such approaches can support clients'
406 needs through active listening, provision of opportunities for client input, regular positive and
407 constructive feedback, and consistent encouragement for patients to take an active role in the
408 care they are receiving alongside the healthcare providers (Ryan & Deci, 2017).

409 Client-centred care has been shown to be more effective when interventions are designed
410 and implemented through a co-production basis that integrates all of the relevant stakeholders
411 from the outset (e.g., patients, counsellors, recruitment officers, policy makers) (Palumbo,
412 2016). Co-production efforts could invite current and/or past AAS users to design and
413 implement programmes alongside formal medical providers. Such interventions could also
414 include case studies on the misinformation conveyed by unregulated black-marketed sources,
415 in addition to harmful side-effects and routes to non-stigmatising healthcare (Palumbo, 2016).
416 It is proposed that over time such efforts may lead to consumer-driven prevention efforts,
417 which can be seen in other domains (e.g., smoking; Hawkins et al., 2017). However, it is
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418 important to state that given evidence-based harm reduction and treatment programmes
419 remain to be developed for the recreational athlete population, ongoing and cautious effort
420 should be spent during programme development and refinement, in order to ensure feasibility
421 and acceptability (Breslin et al., 2017; Oliver, Kothari & Mays, 2019).

422 Lastly, it is evident that research on specific harm reduction services and psychiatric
423 approaches to treatment is lacking among athletes (Creado, & Reardon, 2016). Hence, co-
424 production interventions should involve regular and reflective research practice, wherein all
425 stakeholders agree on the research questions, collection and interpretation of data, and
426 recommendations on further therapeutic approaches (Oliver, Kothari & Mays, 2019). We
427 hope that that the present study contributes further insight into the experiences of AAS use
428 among recreational athletes, and ultimately contributes to harm reduction of AAS and
429 associated behaviours.

430

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435

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