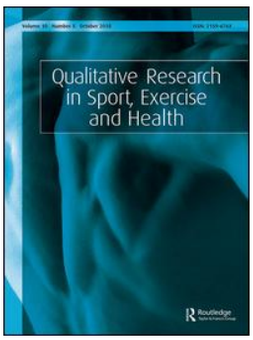

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Fragile femininity, embodiment, and self-managing harm: an interpretative phenomenological study exploring the lived experience of females who use anabolic-androgenic steroids

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ABSTRACT

Little research exists on the lived experiences of female anabolic-androgenic steroid (AAS) use from a harm reduction perspective. This study aims to address this gap and explore the experiences, perceptions, and perspectives of AAS-using females through their journeys of starting, using, and coming off AAS to facilitate appropriate public health policies. Four females, recruited using opportunistic purposive sampling, participated in semi-structured interviews. Using Interpretative Phenomenological Analysis (IPA), four superordinate themes clarify the experiences and narratives detailed by the participants: preparation and anxiety (before using AAS); deviation from feminine identity (during AAS use); turbulence of cessation (end of AAS use); and rediscovering femininity (post-AAS cessation reflections). The results show how harm arising from AAS use is characterised by the development of virilising effects and the complex framing of their feminine identity, providing a clearer image of how harm is defined and managed by this population. While participants anticipated adverse side effects, this did not prevent negative emotions arising from their development. Our results also suggest that gender identity in this unique population is inseparable but not irreconcilable with the changing body. Illuminating this specific facet of AAS use can inform holistic, meaningful, and more inclusive harm reduction measures by adding experiential information from this unique but understudied and hard-to-reach group.

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Interpretative phenomenological analysis; harm reduction; image- and performance-enhancing drugs; bodybuilding; steroids

Introduction

In the context of human enhancement, classifications surrounding normality or deviance continuously evolve. Consequently, historical norms or values cannot be used to define boundaries for human enhancement practices. The contemporary perception of the body reveals the shift from being an unmodifiable entity to an adaptable medium capable of fitting desired aesthetics, function, or experiences, potentially surpassing 'normality' (Lipovetsky 2005). Exponential advances in medicine, pharmacology, and technology have rendered pushing the boundaries through human enhancement increasingly accessible. However, such practices raise questions about fairness and their impact on health and wellbeing. Human enhancement also impacts healthcare and regulatory bodies in caring for individuals using image- and performance-enhancing drugs (IPEDs) (Sagoe et al. 2015; Ainsworth, Vargo, and Petróczi 2018). One widely used group of IPEDs are anabolic-androgenic steroids (AAS) (Ainsworth, Shelley, and Petróczi 2018). Appropriate healthcare policies for AAS harm

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reduction should ideally be developed together with those affected, thus providing a deeper understanding and more effective policies.

AAS context

AAS are synthetic substances derived from structural modifications of the testosterone molecule (Ainsworth, Shelley, and Petróczi 2018; Kanayama and Pope 2018). Such structural changes maximise the anabolic or androgenic aspects of each compound (Kicman 2008). Specifically, the gym-going community use AAS for various ergogenic effects (Ainsworth, Shelley, and Petróczi 2018). Ergogenic effects include improved muscular hypertrophy, enhanced central nervous system neural transmission, and improved bone density (Hoffman and Ratamess 2006). However, there are also a plethora of potential adverse effects, including adverse psychological aspects (e.g. mood changes), cardiovascular effects (e.g. transient high blood pressure), and sexual dysfunction (Hoffman and Ratamess 2006). Being a male sex hormone, AAS use can induce virilisation, the development of masculine features in females. Examples of virilisation include voice deepening, breast tissue reduction, changes in body fat, excessive facial hair and acne, enlarged clitoris, and irregular or absent menstruation (Ainsworth, Shelley, and Petróczi 2018). Some, but not all, of the masculinising effects are reversible with timely cessation of AAS use. (Figure 1)

Individuals using AAS typically use them in protocols called cycles. In this context, a 'cycle' (or 'cycling') is the term defining the specific protocol of AAS use, often encompassing the duration of AAS use alongside a specific compound choice (Ainsworth, Shelley, and Petróczi 2018). Furthermore, current evidence suggests a general prevalence population-wide usage rate of approximately 3.3% (Sagoe et al. 2014). Despite this relatively low population-specific prevalence rate, AAS use is considered a growing public health concern (Kanayama, Hudson, and Pope 2008;

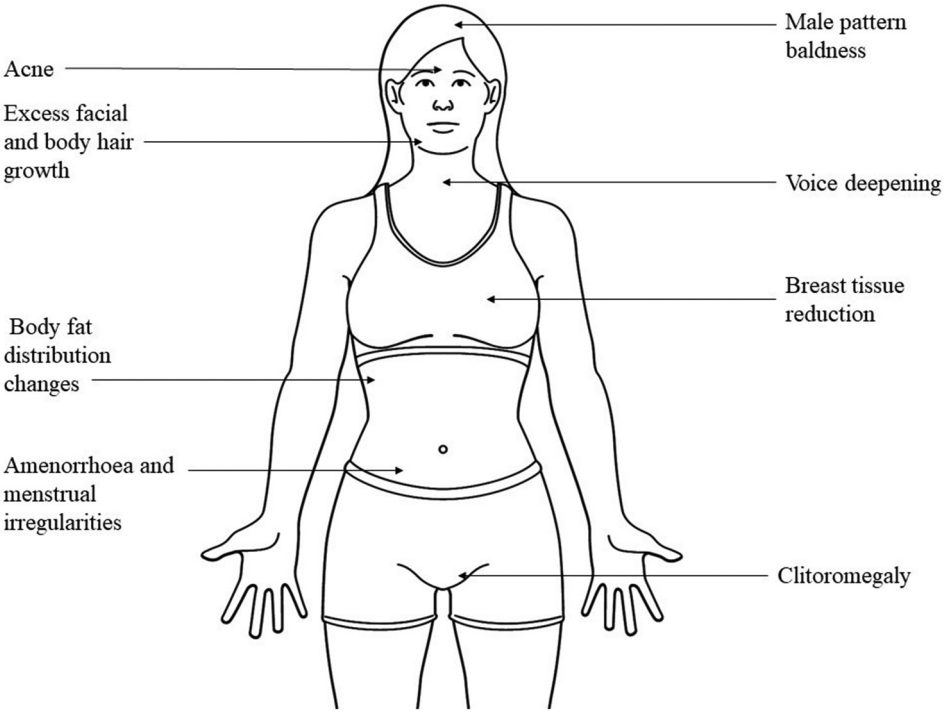

Figure 1. Diagram outlining virilisation effects. Information obtained from Ainsworth et al. (2018).

Nicholls et al. 2017), due to its association with potential health and psychological consequences (Yesalis 2001; Sagoe et al. 2014).

Female AAS use

There is currently a greater understanding of male AAS use and its effects compared to female AAS use (Monaghan 2002; Grogan et al. 2006; Bunsell 2013). This understanding of male AAS use is grounded primarily in quantitative studies within the medical literature and often focuses on secondary male hypogonadism (Monaghan 2002). The discrepancy in understanding of AAS use in males and females possibly stems from the relatively low prevalence rate of female AAS use (i.e. 1.6% compared to 6.4% for males; Sagoe et al. 2014). However, disparate reports of lifetime prevalence of female AAS use have been assumed to be caused by ambiguous wording and confusion between anabolic steroids and corticosteroids in nationwide surveys (Kanayama et al. 2007). Furthermore, the stigma attached to female AAS use means very few AAS-using females are willing to disclose or discuss their experiences of AAS use, even in the bodybuilding subculture.

Although female AAS use remains an under-researched area (Havnes et al. 2020), there are a small number of studies which have started to explore the female experience of using AAS (e.g. Monaghan 2002; Grogan et al. 2006; Bunsell 2013; Havnes et al. 2020). These studies highlight how females are willing to use AAS to reach their goals (i.e. building muscle) or view AAS use as a 'necessary evil' to compete in bodybuilding competitions (Grogan et al. 2006). AAS-using females have also been critical of the lack of information available on the side effects of AAS use, and spend considerable time researching and/or seeking advice from trusted and knowledgeable others (Grogan et al. 2006; Bunsell 2013; Havnes et al. 2020). These studies also highlight how females often express concern about the masculinising effects of AAS (i.e. fertility, body image, pitch of voice), and either only use AAS in minimal ways during the lead up to competition (Grogan et al. 2006) or carefully manage the masculinising side effects and risks to maintain their appearances and identity as feminine (i.e. keeping drug doses low, cycle lengths short, periods of recovery, avoiding highly androgenic compounds; Bunsell 2013). Monaghan (2002) highlighted how societal ideals of femininity are a constraining effect on female AAS use – muscularity and the development of secondary male characteristics are not considered part of the feminine 'norm'.

Taken together, these studies have provided an initial understanding of the complex and multi-dimensional influences relating to female AAS use. Specifically, female AAS use is considered as a calculated 'balancing act' between deliberately cultivating muscle gain and maintaining a stereotypically 'feminine' appearance (Grogan et al. 2006; Bunsell 2013). However, although these studies have provided a broad and descriptive understanding of female AAS use, future research is needed to provide deeper insights into the individual lived experiences of AAS-using females; the individual decision-making processes, the navigation of side effects, and the processes of both starting and coming off AAS. Furthermore, the potential impacts of AAS use on the feminine identity at different stages of this process, and on health and psychological wellbeing, is largely missing from the literature. This is somewhat surprising considering that unwelcome deviations from feminine identity can negatively influence psychological wellbeing (Kitzinger and Willmott 2002). In order to address these gaps, the present study aims to explore, through lived experiences, how AAS-using females navigate and experience their AAS use through different phases of their journey and how they self-manage potential harms to their health and psychological wellbeing.

Methods

Research approach: interpretative phenomenological analysis (IPA)

To best address the research aim, Interpretative Phenomenological Analysis (IPA; Smith 1996) was selected to yield rich personal accounts of female AAS use. IPA originates from health psychology

(Smith 1996; Smith, Flowers, and Larkin 2009) and is concerned with understanding lived experience and how participants make sense of their experiences. IPA is idiographic in nature (i.e. detailed study of each case in turn, prior to the move to more general cross-case analysis), grounded in phenomenology (i.e. detailed examination of personal lived experience), and adopts an 'double hermeneutic' interpretative approach (i.e. the researcher is trying to make sense of the participant who is trying to make sense of what is happening to them; Smith, Flowers, and Larkin 2009; Smith and Osborn 2015). The dual commitment of IPA to the principles of phenomenology and hermeneutics made it a good fit in terms of yielding rich individual descriptions of female AAS use combined with psychological interpretation (Papathomas and Lavallee 2010).

Participants and sampling

Purposeful sampling was used to recruit a homogeneous sample of four females with lived experience of AAS use (Smith, Flowers, and Larkin 2009). Consistent with previous IPA studies (i.e. Papathomas and Lavallee 2010) a brief contextual synopsis of each participant – 'Alice', 'Jenny', 'Anna', and 'Sandra' (culturally appropriate pseudonyms) – is provided below.

Alice is a married Asian-American competitive amateur female bikini bodybuilding competitor in her late twenties living in the USA. She has recently completed graduate school. She has been using AAS on and off for multiple years and has always enjoyed fitness, alongside musical hobbies.

Jenny is a married Caucasian powerlifting coach in her early thirties living in the USA. She is a retired elite-level female competitive powerlifter and at the time of the interview, was pregnant with her first child. She has been using AAS on and off for several years, before coming off AAS permanently last year.

Anna is Caucasian British female in her early forties, who currently works within a people-facing sales role in the UK. At the time of the interview, she was in a relationship. She is a competitive powerlifter and started using AAS several years back to help recover from an injury. She did not take any breaks from AAS during this timeframe, however at the time of the interview, she had been off-cycle for several months.

Sandra is a single Caucasian female in her early fifties. She works in a people facing sales role in the USA. She is also an amateur competitive female physique bodybuilder. Sandra has been competing in women's physique for several years. Her AAS use has been on and off, depending on the goals of her training cycle.

Procedure

Following institutional ethical approval, the lead author contacted social media (e.g. Facebook) bodybuilding groups using established networks. These networks were chosen as she had previously established rapport with this niche community through personal involvement (training) and previous research (Ainsworth, Vargo, and Petróczi 2018). Pre-existing trust and familiarity facilitated the recruitment processes (Liamputtong 2007). The use of opportunistic purposive sampling is congruent with IPA's philosophy, as females with direct experience of AAS use could volunteer to share their lived experience (Smith, Flowers, and Larkin 2009). Four females with experience of AAS use responded and agreed to participate in the current study. Prior to data collection taking place, an 81 minute 'bracketing' interview was conducted by the second author due to the first author's interactions and involvement within this community. This enabled underlying perceptions, experiences, and concepts to be reflected upon before the start of the interview process (Tufford and Newman 2012). Following this, all participants provided informed consent and chose a specific interviewing method (e.g. online or phone interviews) due to their geographical location. The average interview length was 42 minutes and after each interview, memos were made by the interviewer to note immediate reflections.

Data collection: semi-structured interviews

In keeping with the ideographic nature of IPA (Smith 1996), semi-structured interviews were used to gain in-depth understanding of each participants subjective lived experiences. Although each participant was asked similar opening questions (e.g. 'Tell me about your experience with using AAS'), the following interview questions were flexible and largely participant-driven (i.e. each participant answered the questions as per their focus and experiences in no particular order; Smith, Flowers, and Larkin 2009). Specific probing questions were used to provide greater detail on their perspectives, reflections, and experiences. Furthermore, consistent with the Husserlian approach (Husserl 1970), contextualisation questions were used to provide a focal point for these experiences. For example, questions about their training history (e.g. 'Tell me about how you got into training?') gave crucial insights into their motivations for AAS use. Other questions explicitly focused on their personal AAS-using experiences ('Which AAS did you use?), the effects of AAS use ("What side effects did you get from those?") as well as on the effects of coming off AAS ("Tell me about what coming off AAS was like for you?"). Finally, imaginative questions were used to add a dynamic element to interviews and explore the phenomenon's stability (Bevan 2014). Through visualising the same experience in a different time and context (e.g. AAS use in the future or past), new insights provided a unique perspective on participants' AAS using experiences.

Data analysis

Following the process outlined by Smith, Flowers, and Larkin (2009), each interview was professionally transcribed verbatim and read multiple times by the first author to promote familiarity. Whilst reading each transcript, the first author made broad annotations of aspects considered particularly important and meaningful to participants. More detailed and comprehensive notes were then generated through inductive *in-vivo* line-by-line coding. These notes focused on the content (e.g. decisions to start using AAS, emotional responses), language used (e.g. descriptions of hair growth such as 'thick' and 'wiry'), context (e.g. age, motherhood), and initial interpretive comments. Secondly, transcripts were revisited and initial notes were transformed into more abstract themes and concise phrases (e.g. 'body hair growth' and 'transition to masculinity') which were grounded in participants' accounts but offered a more psychological conceptualisation. Thirdly, themes were then listed chronologically and connections between themes (i.e. conceptual similarity) were explored and grouped together into either overarching 'superordinate themes' or sub-themes. For instance, facial hair growth was clustered with hair loss (i.e. male pattern baldness) to generate deviation from femininity. Once case-specific analysis was complete, this case was subsequently 'bracketed' and the next participant was examined following the procedure outlined above. Following this, the final lists of superordinate themes were further examined to facilitate pattern recognition as well as observation and reflection upon individual differences between participants' experiences. Finally, a narrative account inclusive of verbatim extracts from participants' transcripts, alongside the lead researcher's analytical commentary, were used to represent the results.

Quality criteria

Drawing upon a 'relativist' approach (Sparkes and Smith 2009), the current study can be evaluated using existing criteria (i.e. Yardley 2008) which have been widely used for judging the quality of IPA (see Smith, Flowers, and Larkin 2009). This criterion includes four broad principles: *Sensitivity to context; commitment and rigour; transparency and coherence*; and *impact and importance* (Yardley 2008). *Sensitivity to context* was demonstrated by providing a detailed review of research related to female AAS use. In addition, the first author was immersed within the community (as a competitive powerlifter, bodybuilder, and researcher) which provided an existing understanding of the underlying cultural nuances, stigma, and discourses surrounding female AAS use. *Commitment* and *rigour* were ensured by

close adherence to the principles of IPA (i.e. ideographic, phenomenological, and interpretive) and the specific use of homogenous sampling, a bracketing interview, in-depth interviewing, memos, and an audit trail of data analysis. Furthermore, *transparency* and methodological *coherence* were achieved through detailed reporting of the study aim, methodological design, data collection, and data analysis process. Finally, the *impact and importance* of this study is illustrated through offering a novel insight into the lived experience of female AAS use and highlighting its potential to develop meaningful interventions to aid the psychological wellbeing of this niche and understudied group.

Results

Data analysis resulted in four superordinate themes which are presented in chronological order of the AAS-use narrative. These themes are: 1) preparation and anxiety (before using AAS); 2) deviation from feminine identity (during AAS use); turbulence of cessation (end of AAS use); and 4) redis-covering femininity (post-AAS cessation reflections).

Preparation and anxiety (before using AAS)

This section uncovers the preparations undertaken, and the anxiety experienced, by the participants before beginning their AAS use. These experiences are categorised under the subordinate themes of making the decision to use AAS, anxiety regarding virilisation, changes in feminine identity, and aspects surrounding control and boundaries.

Making the decision to use AAS

All participants began their training journeys without intending to use AAS but their reasons for starting differed. For Anna, the main reason for her first cycle was 'not from a strength point of view initially, but was because certain ones are known to help the joints, to help the discs, and that is why I started to use some Nandrolone in particular' (Anna). For Sandra, the reason was predominantly aesthetic focused. She describes how she 'didn't like the way I looked, I wasn't hard enough in my opinion, I didn't think that I was, not that I wasn't lean enough but I wasn't, I didn't feel like hard enough.' (Sandra). Alternatively, for Jenny, if it was a shortcut to getting certain results, she too wanted to take that shortcut:

> I just kind of started hearing about it that other people were doing it and that other girls were doing it and I was like well yeah I want to do it too if it's like a shortcut, that's why I was doing it because it was like a shortcut and that's why I started (Jenny).

Alice's AAS use began when her coach informed her it would enable her to be competitive and reach the national-level competitions. Alice acknowledged her competitiveness and wanting to be the best she could be:

> He was like, you know, "if you want to get to the national level, most of the girls there are using something and you don't have to but it's going to be a much longer and much tougher road if you want to go that road." So, I was like, well I mean I like being really competitive and doing well at whatever I do so I'm going to go for it (Alice).

Participants' motivations for commencing AAS use are rooted heavily in self-improvement, akin to their reasons for beginning training. For them, using AAS is a 'level up' from training without using AAS. Particularly when making the transition from just 'working out' to 'training' for a competitive goal, this resulted in a shift in participant's motivations and contributed to the decision to use AAS.

Anxiety regarding virilisation

Following the decision to use AAS, all participants acknowledged there would be side effects; however, anxiety remained regarding their individual reactions to the substances. The anxiety experienced by participants prior to starting AAS were strongly related to the risk of virilisation, as

Sandra described 'the big side effect is your face changing and looking more masculine and that I wasn't willing to do so that was what I was worried about' (Sandra). For Alice, her concern 'was like irreversibility versus, you know, fixability' (Alice). This fear is expressed differently with Sandra through the amount of research she did before starting her AAS use:

> Even the Anavar, it took me, literally researched Anavar for a year before I even thought about taking it because you know, you're basically changing your hormones and it's a scary thing (Sandra).

The term 'even the Anavar' is indicative of the commonly held perception that Anavar is a 'weaker' compound and often recommended as the first AAS compound for females. Despite its perceived 'weakness', Sandra still did considerable research before beginning her AAS use. The research before using the compound indicates the strong need to make an informed decision; the ability to take ownership through making a choice was important to participants.

Control and boundaries

From the beginning, participants were determined to maintain control over their AAS-using decisions. Control was exerted through creating and enforcing boundaries concerning the acceptability, or lack thereof, of potential side effects. Sandra did this through a risk/benefit analysis relating to the use of AAS:

> Until you decide that you want to take the risk and it is a risk, you're really not going to know how it's going to affect you, when you come on or off. You just don't know, it's the chance that you take (Sandra).

For Sandra, regardless of how much research she did, there was still a strong element of the unknown as she would not know how compounds affected her until she used them. Levels of individual variation meant predictability was non-guaranteed.

This decision-making capability is important primarily for mitigating the risk of developing unwanted side effects, either through dosages or compound choice. Although they cannot control their sensitivity to compounds, they can control their compound choice, thus potentially lessening the risks of using AAS. For example, when asked which compounds she would not do, Sandra discussed Trenbolone (a highly androgenic compound):

> Tren, I won't do it. That's one of the things a lot of women do in prep and I won't do it, I don't know why I won't do it, I don't know, it kind of scares me, I don't know why (Sandra).

The word 'scares' indicates the fear associated with using compounds on the other side of the spectrum; compounds used by very few females. Effectively, the more potent the AAS, the higher the risk of developing virilising side effects and beyond that, the bigger the risk of developing permanent side effects. Compound choices were also related to the goals in mind, alongside how 'female-friendly' they are. Sandra outlined how 'there will be certain anabolics that are weaker that are okay for women and then you start, and when you start getting into other ones like Tren, to me that's just a little too much. I'm not going to compete in the Olympia [an elite-level bodybuilding competition], I'm not going for my pro card' (Sandra). The word 'weaker' implies their perceived suitability for females. Exerting control over compound choices and the choice to use AAS is indicative of participants' attempts to mitigate virilisation side effects as much as possible.

Control was also demonstrated through regulating disclosure of use. For Alice, she outlined how she 'like[s] honesty but … also like[s] information control' (Alice). For Alice, her requirement for information control outweighs the element of openness relating to her AAS use. Through information control, participants exert control over who is 'allowed' to know about their use and who is not. This decision-making ability is essential for mitigating negative judgements and navigating stigma, particularly in a community as stigmatised as AAS-using females.

Deviation from feminine identity (during AAS use)

This theme explores the experience of participants' perceived deviation from feminine characteristics during their AAS use cycles and its impact on psychological wellbeing. The subordinate themes within this section explore the experience of the gradual onset of side effects and the discomfort and pain associated with virilisation.

Gradual onset of side effects

During their cycles, participants commented on the gradual onset of virilising side effects. Jenny experienced it as:

> A very gradual thing, it's not like I just like woke up one day and had a beard or anything, it was super gradual and I'd have like a couple more hairs … and then one day I was like "oh I'm just going to shave them off" and I was like, "oh my face is so smooth, so maybe I'll go and have one once every few weeks" and they kind of got maybe more frequent and then it ended up eventually after a couple of years or something, it was like every day (Jenny).

The differences in expectations and reality indicate how, for Alice, it was not as drastic as she assumed it would be. She compared the experience to 'losing your virginity for the first time, it's like "sex is so scary, oh my god" and then you do it and you're like, "oh I don't have STD, I'm fine"' (Alice). This particular example indicates a fear of the unknown, particularly in the lack of direct experience regarding what it will feel like and how they will be impacted. Secondly, this segment indicates a 'deflowering' of sorts; a growing up, or maturation, in their training career and choices. After all, using AAS was considered the 'next step' in participants' training lives. The second facet of this quote indicates how the initial severe side effects she expected did not appear, and that, perhaps initially, her fears were unfounded.

Discomfort and pain of virilisation

All participants reported experiencing side effects from AAS use. However, the specific side effects which caused distress varied from individual to individual. Anna explained how she 'started to notice … a lot of hair loss from my head which was quite devastating' (Anna). Jenny's experience of hair loss was more sudden, as she describes how 'one day I was like really self-conscious about like putting my hair back because you could see like this hairline' (Jenny). It was not only unusual hair growth and/or loss that they were uncomfortable with; Anna described her experience with hair growth, describing '[a] change of texture, so very wiry, very strange, curly hairs that I'd never had, growing in very strange places like my neck, my face started growing facial hair. I was constantly shaving' (Anna). Hair quality and location are important aspects of femininity for these participants. The texture, location, and amount of hair suggested a gradual shift towards masculinity; these females were describing excess body hair growth, alongside potential male pattern baldness. Long hair on the head, alongside fine body hair, are perceived as traditionally female features. Losing these characteristics signifies a departure from the feminine norm and entering uncharted territory. Shaving on a near-daily basis is a constant reminder of masculinity for the participants; these changes are inescapable, prominent, and highly visible on their faces.

Other side effects included voice changes, although it affected participants differently. For Alice, her singing voice was a part of her core identity. Being a soprano for many years and renowned socially for her singing voice, Alice describes the process of her losing her voice almost as if she is grieving its loss:

> Like during the cycle I'd like always check to make sure it wasn't dropping too low, and so I'd record myself singing and then at some point I was like, oh no, this is like really different. And then there's like this app that helps you, you know, figure out if your voice frequency is like, it actually labels it, it's like feminine, androgynous, masculine and you know, before it always fallen into very feminine, and then I landed in androgynous, I was like, oh no, people can tell. And then at some point when I wasn't paying attention … it like put me in masculine and I was like, oh my goodness, so that was a bit of a shock, you know … I'm pretty sure I cried multiple times over

> the last, you know, couple of months about this voice or the changes in my voice … my voice changed like pretty significantly … (Alice).

The pain from losing this integral part of Alice's identity is palpable. Her changes in her voice are a further indication of a deviation from the feminine towards the masculine. This change in voice crossed a boundary that she had set in stone and was categorically uncomfortable doing so. This is not only a threat to her feminine identity, but also a threat to her identity as a soprano singer and a bikini competitor – the latter being a hyperfeminine category for female bodybuilders.

Although every participant experienced virilising side effects, each participant drew different boundaries on the acceptability and unacceptability of side effects. With the onset of side effects, each one came to terms in different ways. However, there was a shared sense of discomfort and struggling to cope with the development of side effects. The substantial impact these had on their body image appeared to strongly relate to the self-perceived deviation of their bodies from their personal definitions of feminine norms.

The turbulence of cessation (end of AAS use)

This section explores the potentially turbulent experiences associated with ending their AAS use. The subordinate themes uncover the decision-making process to come off and the emotional upheaval associated with coming off AAS.

Making the decision to come off

There are two pathways for AAS-use cessation, the first is coming off between cycles. Alice and Sandra both describe coming off in these terms, saying coming off is not an option for either of them. Sandra explained how she has 'taken eight-week breaks, I can take even longer, you have to ride it out because you can't be on it constantly, you have to come off, you have to' (Sandra). Alice explains in further detail the connection between her goals and coming off and how, for her, coming off was related not only to her health, but also her goals:

> The health risks of doing it year-round are not worth like, you know, don't match up with my goals … I'm not trying to be a fitness model and like look good year-round, I just want to look [good] for like competition and that's it, so yeah, it didn't match up with my goals but I could see if someone was a fitness model and needed to look good all the time, then they would stay on cycle all the time … [Coming off] is what I need to do in order to reach my goals … as far as balancing health and goals (Alice).

As outlined, Alice reflects on how it might be considered 'necessary' for those who make a livelihood from their appearance to stay on year-round, despite the associated health risks. There is an inherent need to 'look good year-round' which might supersede the health benefits of coming off. Nevertheless, for Alice and Sandra, coming off was considered mandatory. This is indicative of the consideration participants had of the impact AAS use has on their health and wellbeing. The terminology of a 'break' shows how coming off AAS is considered a respite for the body.

The second pathway is permanent AAS-use cessation, as with Anna and Jenny. Anna describes reaching this point by outlining how distressing she found the physical changes, as 'every time I looked in the mirror, I didn't see a woman, I saw a man, and I was like "I don't like this anymore"' (Anna). Due to her discomfort with her aesthetic appearance, Anna decided to come off AAS permanently, as 'it was only as time went on that I started to think "you're not really looking like a woman anymore", and that's when I started to really dislike it and decided that this isn't for me anymore' (Anna). Meanwhile, Jenny's unplanned decision to permanently come off coincided with her reaching her powerlifting goals. For Jenny, 'it was never really a planned thing though, it was never like, "ok I'm going to hit these numbers and like retire", I just guess I felt fulfilled after those last couple of meets' (Jenny).

Emotional upheaval

The experience of coming off AAS differed across participants. Sandra described feeling 'depressed . . . not severely depressed cause I don't have depression issues . . . you kind of feel sad I guess . . . it's definitely more mental, that's the harder part than the physical part' (Sandra). For Alice, coming off presented other challenges of coming off 'cold turkey' such as adjusting to a loss in strength:

> It was like cold turkey and I did have a lot of like strength loss, which I wasn't expecting. Yeah, that was, I almost think part of it was like psychological too . . . when I'm on cycle I'm able to push a lot more weight, and I feel a lot more confident in doing stuff, whereas when I'm off cycle, I'm a lot more conservative . . . just like really focusing on like form and things like that (Alice).

Sandra experienced similar challenges when coming off AAS. She describes the loss in strength as akin to having a 'bad day' in the gym:

> I mean everybody has a bad day, you know when you PR [personal record], you know, and then all of a sudden, two weeks later, you can't even lift what you did before you PR'd, it's like, you know, it's upsetting but that's just the way it goes, you're just not going to be as strong (Sandra).

Sandra also described the negative impacts associated with experiencing physical joint pain whilst coming off:

> It also helps with joint, you know, your joints, lubricating of joints, your joint recovery and then when your joints start hurting too that didn't hurt before, that also messes you up, you might not be able to work out as long, you might, you know, you hurt a little more, that might hurt you, your legs, if it's a leg day, you might not be able to walk, instead of one day, three days, you know, stuff like that (Sandra).

These accounts demonstrate the emotional upheaval associated with coming off AAS. For some, it was more pronounced than with others which suggests that, to some degree, individual susceptibility is responsible for the severity of psychological upheaval and coming off cycle. However, cycle duration and taking breaks between cycles are potentially important determinants of AAS cessation difficulties. Nevertheless, an important mechanism for reducing the physical and psychological harm from AAS use is clear; taking breaks off AAS leads to initial psychological upheaval, but a healthier body and mind later on, as well as preventing the development of unwanted male characteristics through waiting for feminine characteristics such as menses to return before going back on cycle.

Dissipation of virilisation

For each participant, most side effects dissipated over time. For example, the receded hairline did recover for Jenny:

> One day I was like really self-conscious about like putting my hair back because you could see like this hairline, that did get a lot better, like it's not, I have not thought about that in a long, long time you know, it's like normal now so I guess that it did go back (Jenny).

The words 'I guess' show some uncertainty concerning whether it has 'truly' returned to normal. Nevertheless, Jenny's realisation that she has not thought about it for a 'long long time' shows how thoughts concerning her hairline have not arisen for a considerable length of time. Jenny also described feeling lucky as she did not expect anything to return to normal. She states how she 'wasn't anticipating that anything would grow back, I thought that's the way it was going to be . . . I really feel super lucky because I feel like other women they don't get as lucky' (Jenny). The term 'feeling lucky' perhaps indicates 'getting away' with her use of AAS; particularly for Jenny, her use of AAS was experimental, with harsher compounds being used compared to the more cautious compound use of other participants. Although she accepted the possibility of side effects becoming permanent, she was nevertheless relieved when they gradually dissipated after coming off permanently.

Another aspect of virilisation dissipation is related to age. Anna discusses how youth can have an impact on the side effects due to the hormonal differences, 'because if a woman's younger and she comes off she's got quite a lot of oestrogen still, so she may have less side effects because she's got higher levels of oestrogen' (Anna). Oestrogen's role is perceived as a 'protective' substance against androgenic side effects. Traditionally considered a 'feminine' hormone, it is lower in females who undergo menopause. For Anna, her age means she has less oestrogen than someone younger; therefore, she feels she does not have as much protection.

Rediscovering femininity (post-AAS cessation reflections)

The following section covers the reflections and experiences of the participants' post-AAS cessation. The subordinate themes within this section explore the shifting of identities and new norms, body image and function, alongside coming off, health, and fertility.

Shifting of identities and new norms

Regardless of the specific pathway of AAS cessation, participants expressed a shift in their core identities – whether this was through a return to what they perceived as feminine for themselves or adjusting to the permanent side effects AAS use can have. For example, not all side effects dissipated. Alice had to adjust to permanent voice changes:

> My voice changed like pretty significantly . . . I was hoping that it would come back but I used to be a soprano and now I can't reach any of the notes I used to, yeah. But that's been hard, I'm still trying to come to terms with it, you know, losing my integral part of my identity . . . I've kind of accepted my voice as it is now, or I'm like, well you know, I can live with it and this is just part of growing up, not growing up but like you know, people will have changes in their identity and this is just one of them, it will be fine (Alice).

The adjustment to this permanent side effect is a notably painful but inevitably necessary process. The hope mentioned by Alice indicates a desire for a return to normal, perhaps to be one of the 'lucky' ones as described by Jenny. However, the journey to acceptance of this new norm (in this case the new normal pitch and tone of her voice) is seen as a process of maturation and 'growing up'. When side effects have become permanent, a level of acceptance is necessary in order to come to terms with new norms. Alice described how she has had to shift her self-perceived aesthetic gender identity from being traditionally feminine to being considered more androgynous. Alice describes how she feels 'okay with [looking] androgynous, because you know, I have short hair, like I can do the whole sporty look, whatever' (Alice). Acceptance for Alice is the core part of moving on from the initial pain of encountering permanent side effects.

For Anna, stopping her AAS use has given her an improved quality of life and is indicative of a shift to new focal norms. The cessation of AAS indicates a shift in identity as a competitor, with a different mindset, priorities, and goals:

> I feel more confident about how I look, I feel good, I never care if I miss a lift, if I miss a lift, I miss a lift . . . to me being a woman is more important, so I want to look good, I want to feel nice. If strengths gone down, it's gone down. I don't really care. I'd rather look like a woman, feel like a woman, feel attractive, feel good about myself, and still go to the gym and still lift, and still compete but understand that it's not going to be at the same level (Anna).

'Feeling like a woman' is considerably more critical for Anna – the return to femininity brought a multitude of positive aspects. For example, Anna associated being off-cycle with reconnecting with others in her social circle alongside feeling balanced, healthy and, more importantly for her, feminine, and confident. The sacrifice in strength and getting to her powerlifting goals is worth it for her improved quality of life.

Body image and function

Off-cycle was associated with multiple physical changes. For example, Jenny discusses how her 'face has gotten so much softer in the last two years . . . I would get like cellulite on the back of my legs and

on my butt, I was like less hard' (Jenny). The terminology 'less hard' and 'softer' demonstrate a gradual return to more feminine characteristics. 'Hardness', as described by Sandra, is another term for lower body fat percentage. The shift to a higher body fat percentage is an indicator of femininity. For Anna, she felt comfortable with her higher body fat percentage:

> I've got fat, I'm not too kind of lean, but I feel so, so much better when I look in the mirror. I feel so much better when I look in a mirror, how I feel, how I look and that's important to me (Anna).

For Anna, regardless of her increased body fat percentage, her self-esteem and perception of her body were significantly higher than before. Her improved self-confidence and self-esteem are worth the 'cost' of losing leanness and gaining body fat. The return of a higher body fat percentage establishes her return to femininity.

Coming off, health, and fertility

Jenny, like other participants, used the return of her menstrual periods as an indicator of health. She explains how, experiencing the return of her periods after AAS cessation, 'it's like "ok like everything's fine", I think that's how I felt like, ok my body still works' (Jenny). The term 'my body still works' demonstrates how important fertility is for AAS-using females. At the time of the interview, Jenny was pregnant in her third trimester. She remarked feeling 'like I had a good run and I mean I'm healthy now and like I can make babies now, so everything happened for a reason or that was just like my path' (Jenny). Childbearing and health appear intrinsically connected for Jenny. The return of periods is an indicator of both health and femininity.

The ability to bear children was also considered paramount for Sandra and Anna. Both are older females who are post-menopausal. They both remarked they would not use AAS if they were younger. For Sandra, this was rooted in the impact on fertility specifically using testosterone would have:

> If I was in my twenties or thirties, I would never, just wouldn't, it could affect your fertility, why would you do that, you don't know, even if you're thinking you never want a kid, in your twenties or thirties, how would you know, you just don't know what's going to happen, why would you mess with that, it's not worth it, for what, for muscle, it's stupid to me, that's just my opinion (Sandra).

The focus on testosterone might stem from its perception as a predominantly 'male' hormone; perhaps demarcating a boundary which should remain uncrossed until certain conditions are fulfilled. The heavily masculine aspect of testosterone might be seen as a significant threat to female fertility for Sandra, thereby deeming it unsuitable for younger AAS-using females. Anna expressed a similar notion related to fertility, saying younger AAS-using females 'should just be very careful if they're young, you know they might want a family one day, well that could be harder' (Anna).

Fertility and childbearing abilities were considered critical to retain. Notably, these views appear more pronounced for both of the older participants, Sandra and Anna. Perhaps it results from post-menopausal thoughts, reflecting on the changes to fertility and the associated impact on the feminine identity that comes with the menopause. Being in the unique, contradictory position of undergoing a uniquely female phenomenon, while encountering the loss of uniquely female experiences (such as the menstrual cycle) might impact the personal importance these participants attach to female fertility.

Discussion

The aim of this study was to understand how AAS-using females navigate their AAS use through exploring lived experience. This study provides a novel understanding of challenges to gender identity as the body changes while on (and coming off) AAS and insights regarding the impact of AAS use on health and psychological wellbeing. The findings corroborate other accounts of female identity navigation in sports and non-sports settings (e.g. Krane 2001; Bennett et al. 2017), with the

added interplay between gender identity and AAS use to facilitate developing targeted public health policies. Although the aim of the study was framed on harm-reduction and management, the impact of AAS use on feminine aspects of identity in this unique sub-population interlaced many themes in an atypical way. Discourse around gender identity and femininity was rooted in the body, and more specifically the functions of the body. AAS using females in this study were protective of their femininity while taking masculinising drugs and striving for a more muscular body.

A plethora of literature exist on the debate whether gender can be defined as distinct concept from the sexed body (e.g. Hawkesworth 1997; Francis 2002; Connell 2008; Paechter 2006), and if gender is not connected to the body, then whether it is identified via 'performed behaviour' (Francis 2008). Furthermore, discourses around the ideal female body is full of contradictory influences (Francombe-Webb and Toffoletti 2018; Brace-Govan and Ferguson 2019; Ferguson, Brace-Govan., and Welsh 2020). Within this study, we offer a new dimension to this debate by linking the participants' feminine identity not to the feminine attributes *per se* but to the *functions*. The body, including the participants in this study, is often defined by its functions. A female body is typically capable of childbearing, whereas the muscular (more masculine) female body of athletes (Krane 2001) expands the capacities of a female body (Beamish and Ritchie 2005) and can lead to better athletic performance and competitive advantage. The feminine vs. masculine dichotomy of the body does not define the core identities of females in this study. Instead, it presents a challenge for AAS to be managed into a desired combination of functions, with idiosyncratically acceptable compromises. An important factor here is the personal agency which creates a unique aspect to gender theorising. It is that the 'challenge' of simultaneously wanting feminine and masculine functions and managing the associated harm to physical and psychological well-being while on, or coming off, AAS (a masculinising hormone) is self-imposed. It is a situation that AAS using females, just like female athletes striving for a muscular body, choose to have and actively create, not something that happens to or imposed on them. AAS using females in our study – similar to protein consuming young females striving for a specific female body ideal (see George 2005; Bennett et al. 2017; Ferguson, Brace-Govan., and Welsh 2020) – actively and continuously managed their experiences and psychological impacts of their chosen path towards achieving a (female) body *they wanted*, and constructed their own meanings about their 'ideal' (female) bodies.

Preparation and anxiety

Findings from the current study highlight how participants approach their AAS use in different ways (extensive research vs. an unconstrained approach). The benefits of AAS use (e.g. physical strength, muscular hypertrophy) outweighed the potential harms via the risk mitigation conducted by the participants on an individual level. AAS risk is described by the participants as the possibility of permanent deviation from the societal definition of 'feminine norms' (Monaghan 2002). For participants, the risk associated with AAS use was partially mitigated through choice of compound and dosage, cycle lengths, time off-cycle, and research. However, whilst physiological changes can be reasonably anticipated and prepared for, the impact of virilisation to feminine identity was uncharted territory for all.

Deciding which compounds to use and why was linked heavily to 'necessity', desired goals and retention of femininity. As outlined in Krane (2001), female athletes who still adhered to hegemonic feminine ideals are privileged in society over those who transgress these boundaries. The consequences of virilisation are many and explain the strong boundaries created by participants. Additionally, virilisation exacerbates the 'female athlete paradox' (Krane et al. 2004) – beyond muscular development, the possibility of the development of masculine features creates anxiety regarding the consequences. In turn, this could explain the problems faced with disclosure of use and the choice to do so outlined by particular participants in this study. Similar results have also been noted in previous research and attributed to 'gender stigma' (Bunsell 2013; Havnes et al. 2020).

Deviation and feminine characteristics

Participants within this study described the gradual onset of side effects and the psychological discomfort associated with them. In line with other studies (i.e. Bunsell 2013; Havnes et al. 2020), this is potentially due to the blurring of boundaries between masculine and feminine, a highly individualised boundary which was experienced by participants in different ways. Other studies within this niche community have focused on the navigation of the feminine identity for female bodybuilders (Wesely 2001; Shilling and Bunsell 2009). These studies cast a more holistic eye over the construction and navigation of the feminine identity within the context of a female bodybuilder's lifestyle. Participants in Boyle's (2005) study took control of their training and nutritional regimes to balance the fine line between performance and femininity. This is similar to the boundaries and controls imposed by the participants in this study – decision-making processes determine choices such as what compounds they will use, how they will use them, and when they come off cycle. The ideas of femininity are flexible within this study; participants enforced their boundaries and ideas of what they considered acceptable deviations from femininity.

To some extent, these aspects of 'acceptability' still fall within the remit of feminine societal norms. Unlike female bodybuilders (Boyle 2005), muscularity in this study was considered positive and potentially harmonious with feminine ideals. Despite this, the process of developing side effects was uncomfortable as emotional and psychological reactions were difficult to anticipate. One potential explanation lies in hegemonic understandings of masculinity and femininity (Krane 2001). Transgression of these boundaries is vilified by society, with potential social repercussions faced such as ostracisation (Krane 2001). Similar dialogue is found in Krane et al. (2004), – the changes participants experienced within the context of AAS use demonstrate their growing transgression of societal feminine norms through the development of 'masculine' features. Indeed, this can be further contextualised in the concept of a 'failed femininity' (Kitzinger and Willmott 2002; Fahs 2018); specifically, how the development of virilising side effects was perceived as a betrayal of their femininity provoking negative emotions such as unhappiness and shame.

The turbulence of cessation

This study also extends existing research (e.g. Grogan et al. 2006; Havnes et al. 2020) by illustrating how coming off AAS presents its own challenges. It is, at least initially, psychologically taxing. Participants discuss the difficulties they experience, alongside struggles in coming to terms with the physical side effects of coming off AAS. However, it also offers an important insight into people's ability to recover from AAS use, therefore providing an important method of harm reduction regarding female use. In line with male studies on AAS cessation (e.g. Griffiths et al. 2017), participants emphasised the importance of coming off for health reasons. However, for female participants, there is an additional effect of mitigating unwanted virilisation side effects, something which does not affect male AAS-users. Similar to the participants in Griffiths et al.'s (2017) study, some female participants in this study reported turbulent withdrawal periods and psychological upheaval while coming off AAS.

Rediscovering femininity

This study also offers an insight into what defines femininity for participants, and how it is situationally re-defined and intimately connected to the feminine functions of the body. Rediscovering their femininity was a complex, yet welcomed, process. These identity reconstructions after AAS cessation are analogous to the processes of biographical disruption (Bury 1982) or biographical flow (Faircloth et al. 2004). Classifying experiences in one of these concepts is challenging due to how participants reframe and view their bodies after coming off. For example, permanent voice change is biographically disruptive; identity and physical feminine features are brought to the forefront of the

mind when before they were taken for granted through being an 'absent present' (Malcolm and Pullen 2018). Furthermore, questioning of self-identity from a gendered perspective and the impact of socialisation activities can have a negative effect in terms of psychological wellbeing.

Another notable aspect was the importance placed on fertility. In this study, health and fertility were closely related concepts. The idea of losing one's fertility is considered a severe deviation from, and threat to, one's feminine identity (Komatsu et al. 2014). In this study, potentially losing one's fertility was an unacceptable side effect for some participants while for others, it was considered an acceptable risk. Fertility is demonstrably linked to core concepts of hegemonic femininity (Kitzinger and Willmott 2002; Komatsu et al. 2014). The reappearance of more feminine features, such as softer jawline, thinning or disappearance of body hair, re-growing head hair, and higher pitched voices was associated with relief. This is potentially due to the return of hegemonic feminine characteristics signifying an escape from the consequences of permanent gender norm transgressions (Havnes et al. 2020). However, a strong functional aspect to these gendered norms (e.g. child-bearing capability, singing) was apparent in the narratives of AAS using females.

Gender identity and the body

Although the in-depth investigation of how AAS-using females experienced and actively managed the interplay between desired effect to a more muscular body and the undesired virilising effects, this study also adds an interesting dimension to the gender theorising and post-structuralist re-theorising debate. In contrast to the post-structuralist view of gender as disconnected from the body (Francis 2008), in our study the body is central to the participants' identities. However, experienced disturbances to femininity such as change in voice in Alice' case, increased facial hair for Anna, fear of having a masculine face for Sandra, and concern about the ability to have a child and hair loss for Jenny cannot be all grouped together under being stereotypical attributes of femininity. Whilst all relate to the body, and thus very much aligns with structuralist approach to gender theorising (Fullagar, Pavlidis, and Francombe-Webb 2018), it is important to note that participants were cisgender females who did not question their gender identity, nor the changes to the body they each experienced in a unique way defined their core identities. Rather, the body for them was a medium which can be both shaped and changed. The body in this sense is defined by its function (Lipovetsky 2005). Where participants struggled (i.e. permanent change of voice, anxiety about childbearing capability) is reflective of the struggle of hypermodern take on the body and the definition of what is 'normal'. In the context of human enhancement, definitions of what is normal or deviant continuously evolve; consequently, we cannot use historical norms or values to define boundaries for human enhancement practitioners. In modern times, the perception of the body has shifted from being an unmodifiable entity to an adaptable medium capable of fitting the desired look, function, or experience and potentially surpassing 'normality' (Lipovetsky 2005). The body is no longer 'a limitation' (an object), but 'a possibility' (a way) that can be changed to fit a desired look, function, or experience.

Our participants' identity was very much connected to the body, but often the body was defined by functions rather than attributes. Armitage (2000) argued when describing hypermodernism that in contrast to modernist approach, it is the function that decides the form, not the attributes. For example, the voice was important to Alice not because a soprano voice is associated with femininity but because singing was important to Alice and having a soprano voice was part of this function. Motherhood, the body's function to reproduce was equally important to those in childbearing age (e.g. Jenny) but also as a principle for those who were beyond this phase (e.g. Sandra). In the absence of a universally agreed measure for what is normal for AAS-using females, or in fact if AAS use is normal for females, each AAS-using female in this study defined 'normal' for herself based on a highly idiosyncratic set of attributes they valued highly. From their accounts we can deduce that on the one hand, this process was not easy but on the other hand, participants managed this successfully for their personal physical and psychological wellbeing individually. As such, no 'best

practice' guidelines can be simply distilled from their personal journeys other than their ability to come to terms with what is 'normal' and creating a new 'normal'. This also highlights the importance they all placed on health and psychological wellbeing. Perhaps because of the importance of these aspects, all four participants in this study talked at length about the extensive research prior to using AAS and exhibited great control throughout their AAS journey. Knowing and 'being connected' to their body, both physically and psychologically, was paramount to their successful management of their AAS-using journey.

Limitations and suggested future study directions

This study should be considered in the context of certain limitations that could inform further research. Firstly, future studies are encouraged to investigate in greater depth female AAS use in the context of gender theory. Specifically, valuable insights could be gathered concerning the impact of societal gendered perspectives and ideals on the experiences of female AAS use. Secondly, this research recruited participants who lived in Western societies. The inclusion of individuals living in non-Western societies could give valuable insights into female AAS use, and its use in the context of other sociocultural environments and corresponding concepts of femininity. Thirdly, due to the exploratory nature of this study, no inclusion criteria specific to AAS compounds were utilised during recruitment. Future studies could explore how cycle length and compound choice can impact the female AAS-using experience. Finally, researchers are also encouraged to address in greater depth the differences in AAS use between differing female athletic populations regarding motives and methods, alongside including females experiencing more profound and potentially permanent impacts to their physical health and psychological wellbeing.

Conclusion and recommendations

In conclusion, this study provides a more in-depth and detailed understanding regarding the patterns of female AAS use than previous literature. While there are some similarities between female and male AAS use, these results shed light on the vastly different challenges surrounding female users and the unique impacts on their health and wellbeing. Notably, this study has built upon previous literature to further consider the harms or risks as defined by female AAS users, and how they are mitigated. In particular, these results highlight the fine line between remaining feminine while participating in sports dominated by male athletes. They also highlight the risks associated with transgressing societal gender norms. Understanding the psychological factors, alongside a holistic consideration of the side effects from female AAS use can practically inform harm reduction policy. It can also offer an initial foundation to conduct more detailed work focusing on gendered perspectives. Harm reduction workers, medical professionals, and those who work with female AAS users can use this information to further their understanding of this community and to gain a more holistic overview of the challenges and choices encountered by female AAS users. Building upon these findings can help develop meaningful harm reduction interventions specific for female AAS users.

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Data availability statement

The data that support the findings of this study are available upon reasonable request from the corresponding author. The data are not publicly available due to the sensitive content contained within the transcripts.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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