

Gateways and gatekeepers: Two factors that influence the use of performance and image enhancing drugs (PIEDs) among UK military veterans

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ABSTRACT

Recent reports have identified that PIEDs use is rising within the Armed Forces leading to concerns over health and concomitant operational risks. The aim of this study was to identify the roles of gateways and gatekeepers on PIEDs use among a cohort of UK military veterans. Semi-structured interviews were conducted with 14 ex-Service personnel. Interviews were transcribed verbatim and thematically analysed using NVivo12 software. Common themes were identified around the ways in which the veterans were introduced to PIEDs and how they accessed them. Gateways consisted of two categories of *Circumstances* and *Behaviour*, including excessive gym use, the need to cope with fitness demands of military service, overseas deployment, and previous experiences with nutritional and body-building supplements. Gatekeepers included friends, colleagues, and mentors and their roles were captured in two categories of *Procurement of PIEDs* and *Information Dissemination*. Recommendations include the need for further research on the roles of gatekeepers and gateways as important pathways to PIEDS use. Additionally, there is a need to build on themes suggested by earlier researchers to identify social, cultural, and economic factors that underpin motives for PIEDs use in the uniformed services. These two recommendations would inform the design and evaluation of PIEDS-related interventions.

Keywords: Physical activity psychology, PIEDs, Motivation, Military, Veterans, Armed Forces, Substance abuse.

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INTRODUCTION

Performance and image enhancing drugs (PIEDs) is a collective term that covers substances that affect human performance and that have been highlighted as problematic by many national and international governing bodies of sport (Maughan *et al*, 2018).

Key motivations for the use of PIEDs are to change body shape and appearance and enhance physical performance (Brennan, Wells & Van Hout, 2017; Piacentino *et al*, 2017). However, it is recognised that the use of PIEDs carries health risks (Piacentino *et al*, 2017) from infections to sudden death (Darke, Torok & Dufloy, 2014; Hope *et al*, 2013; van Amsterdam, Opperhuizen & Hartgens, 2010).

Given the above and the fact that drugs use has been associated with criminal behaviour among military veterans (Schultz *et al*, 2015), it is important to gain further knowledge about the use of PIEDs by former military personnel. In particular, we need to identify what influences PIEDs use.

Whyte *et al*'s (2021a) recent review of the literature concerning the use of PIEDs in both serving and retired Armed Forces personnel, highlighted that anabolic steroids (n=10 of 20 papers reviewed), weight loss supplements (n=10) and bodybuilding agents (n=7) were the most mentioned products. They identified that PIEDs were employed variously throughout military careers with use increasing substantively when personnel were deployed compared with before or after operational tours (Lui *et al*, 2018; Paisley, 2015; Varney *et al*, 2017).

Several motivations for PIEDs use among military personnel were highlighted, amongst which image enhancement and coping with the physicality of active service were prevalent (Whyte *et al*, 2021a). Image enhancement was related to weight reduction, muscle development, negative self-image, and body dysmorphia (Campagna & Bowsher, 2016; Carol, 2013; Mattila *et al*, 2010). Keeping up with the physical demands of service was associated with expectations placed upon the Armed Services and the demand for optimal fitness and strength to carry out military duties (Boos *et al*, 2010; Jacobson *et al*, 2012; Herbst, McAslin & Kalapatapu, 2017). Bucher's (2012) investigation noted PIEDs use helped combatants to deal with long foot patrols. This study also noted psychological motives for taking PIEDs to cope with the stresses and strains of combat, holding their nerve, and preparing for the possibility of killing another human being.

Negative physical health outcomes among military users have been reported including severe vascular, organ, muscle, and blood conditions (Mattila *et al*, 2010; Brazeau *et al*, 2015; Harris, Winn & Ableman, 2017; Liane & Magee, 2016; Magee *et al*, 2016; Young *et al*, 2012). Worries around negative mental health have also been reported following PIEDs use, including extreme aggression, and behavioural change (e.g Varney *et al*, 2017; Herbst, McCaslin & Kalapatapu, 2017).

Whyte *et al*'s (2021a) review suggested that PIEDs use often started in basic training or when overseas (Lui *et al*, 2018; Bucher, 2012). Additionally, a number of other factors were also found to be associated with taking PIEDs, including poor educational attainment, heavy alcohol intake, smoking cigarettes, and a history of high intensity physical training (Boos *et al*, 2010; Jacobson *et al*, 2012; Mattila *et al*, 2010). Those factors are viewed as important antecedents to commencing PIEDs use (Coomber *et al*, 2014; van de Ven & Mulrooney, 2017). As such, they are fundamental "gateways" to use. A gateway is a global construct that is used to explain how contextual factor(s) or behaviour(s) influence future lifestyle choices (Wilson, 2020), in this case, PIEDs use.

To counter the lack of research of PIEDs use in the UK military and provide guidance for possible interventions or policy changes, a commissioned study was undertaken by Whyte *et al* (2021b). It aimed to identify motives that underlay PIEDs use among former Service personnel, how they were introduced to PIEDs, and the knowledge base of users around the process of taking PIEDs as well as potential ramifications. However, that study did not specifically focus on the manner of engagement in PIEDS use, nor the roles of others in the process. The present paper aims to rectify this neglect.

Aims

The aims of this study were to investigate what key paths led to PIEDs use among former military personnel, and the roles of other people in the process.

METHOD

Participants

Participants were current PIEDs users who had previously been members of the UK Armed Forces (n = 14; 13 males, 1 female).

Sampling

Purposive sampling (Palinkas *et al*, 2013) was employed to recruit participants with “snowballing” (see Naderifar, Goli, & Ghaljaei, 2017) used to expand the recruitment pool. Recruitment took place in local weight-training gyms that were known to have PIEDs users as clients. Information about the study was supplied to possible participants who met the study’s criteria, following which they completed informed consent forms.

Data collection

The University of Sunderland Research Ethics Sub-Committee granted ethical approval (number 004364), following which participants were recruited. An *aide-memoire* was developed to ensure consistency of data collected, while offering flexibility of approach. The *aide-memoire* was a dynamic document that expanded to address issues raised by participants. Semi-structured interviews were undertaken with each interview lasting between 30 and 80 minutes. Interviews were recorded for later transcription.

Analysis

Following interviews, participants were copies for respondent validations. On return, the recordings were transcribed *verbatim* leading to 184 pages of A4 text (44,360 words) being made available for analysis. Transcripts were uploaded onto NVivo 12 Software (QSR International, London: <https://www.qsrinternational.com/nvivo/nvivo-products/nvivo-12-plus>). Following Mayring’s (2000) approach, transcribed texts were coded for meaning units (MU) that describes or “means” something in the context of the study). Next, each MU was ascribed a descriptor(s). Those descriptor headings (embryonic themes) then became “umbrellas” below which comparable MUs were apportioned. This was an iterative process as additional themes were developed if MUs did not “fit” an existing theme. The final two stages involved the review of themes before clustering them into logical groups (in one case, second order themes were deemed appropriate also), forming categories. These were then appraised, and conceptual topics developed (General Dimensions) into which each category was located. This provided a hierarchical, structured, logically interpretable means of presenting data.

RESULTS

Participants were 32.14 years of age on average (range 26 to 44 years of age) and had been based overseas

in combat zones. Most had enlisted at 18 years of age (mean = 18.6 years, range 18-20 yrs.), and had served in the Armed Forces for a mean average of 7.3 years (range 6 to 10 years). Participants had been retired for between one and seventeen years (mean = 6.28 years). The mean length of time of PIEDs use was 7.93 years, however, the range was large (1 to 22 years of PIEDs use), with ten users reporting that they took PIEDs during their time in the Forces. Inductive analysis resulted in data being placed in two conceptually different areas (termed General Dimensions [GD] in this study). The GDs were designated as **GATEWAYS** and **GATEKEEPERS**. **GATEWAYS** consisted of seven themes which on further analysis were compressed to two categories (Figure 1), while **GATEKEEPERS** comprised of ten 1st order themes. These were further assigned to four 2nd order themes and ultimately to two categories (Figure 2).

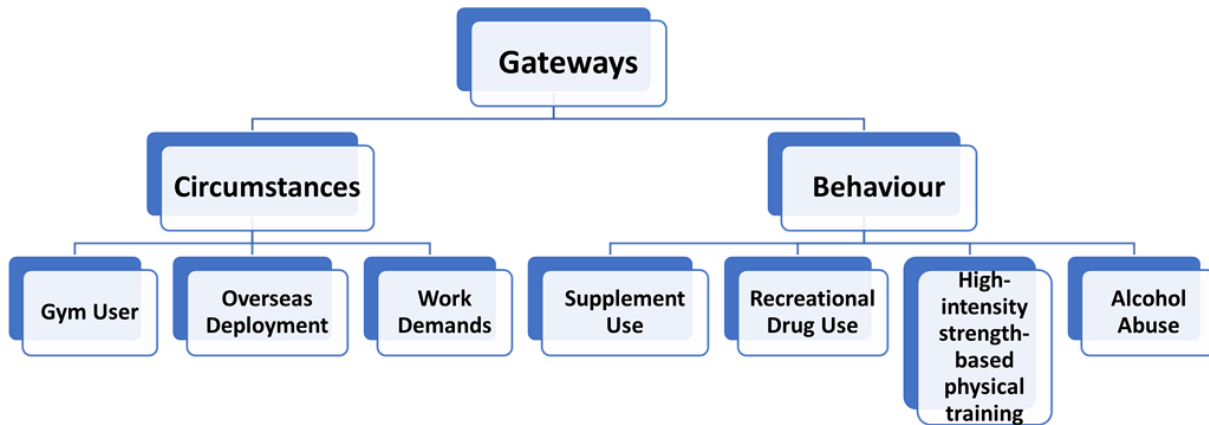


Figure 1. Circumstantial and behavioural aspects of gateways to PIEDs use among Armed Forces veterans.

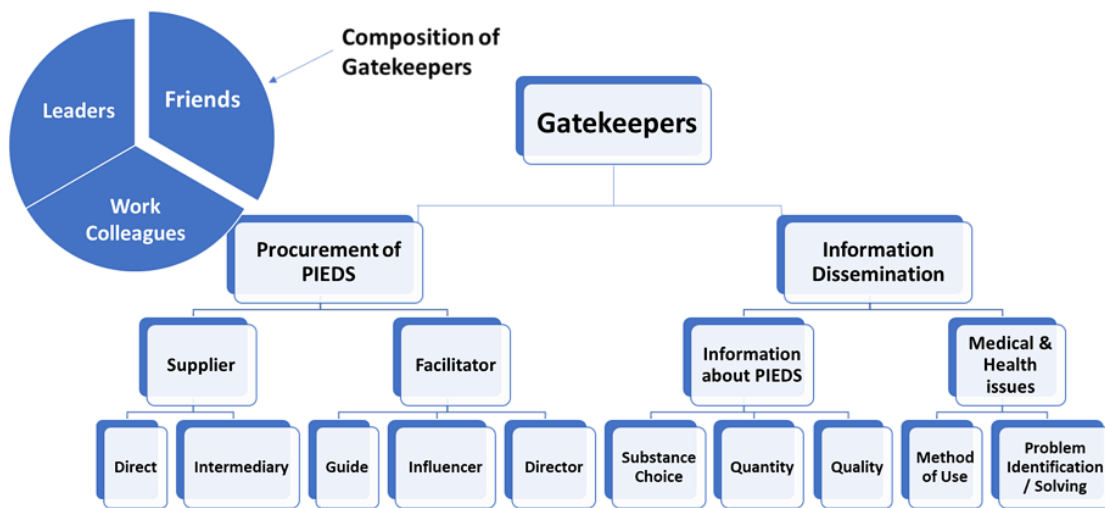


Figure 2. Armed Forces veterans’ PIEDs use: composition and functions of gatekeepers.

GATEWAYS: Circumstances and behaviour were the two categories in this GD.

Circumstances

This category comprised of three themes: *Gym User*, *Overseas Deployment* and *Work Demands*.

Gym User: One of the least reported themes (seven participant responses) made direct reference to gym usage as a gateway. Comments related to the role of the gym in providing a motivational culture due to the perceived ethos of the gym, and the people that use it:

I went to that gym knowing that most of the members were serious lifters or body builders. Nobody was just a “*gym bunny*” to keep trim. There were always guys moving around and when they got to trust you, they give plans and help. I wanted to look like them and the culture was to work hard, work often, and take whatever you need. (Male 28 [years]).

Overseas Deployment: Similar to the numbers of responses for *Gym User*, 50% of the participants viewed being deployed overseas as a circumstance that led to PIEDs use, in part due to time to work-out in the gym alongside the need to keep fit for military duties, and mixing with personnel from other countries (mainly USA armed forces):

Before I went out [to Basra] I took supplements. We were stationed near Americans and lifted [weights] with them. We had to be ready physically and mentally in case of trouble from insurgents and keeping fit became more important than ever. I suppose the supplements just became gear [PIEDs] as the Yanks all seemed to take them. (Male, 26).

Work Demands: The final theme reported in this category reflected job related issues that all of the participants vocalised as important. One former soldier noted that even before commencing basic training he felt that he needed to improve his fitness status:

Before I had even signed-on I knew that I wasn't too fit. I had been okay [fit] in junior school but by the time I was ready to leave I was a slob. X-box and takeaways made sure of that. A lad [boy] I knew in school persuaded me to go to the gym and he got a training schedule from his uncle. I started on [legal] supplements then. (Male, 26).

Another factor stated by 12 of the 14 participants as being important in their decision to take supplements and/or PIEDs, was the Army's historically brutal training regime. “*Beasting*” is a squaddie's [new enlistee] term for high intensity, highly demanding, and energy sapping drills as a short-cut to fitness development, or, at times, as a form of punishment. A former infantryman said:

Beasting was the hardest part of it. I've no idea why it needed to be done as most of us were seriously motivated to do well anyway, or at least as well as we could and that's all that should be asked for. There were grown men in tears at times. That starts a culture of doing whatever you need to get through and for me that meant taking supplements and some pills. (Male, 26).

Behaviour

Four themes formed this category: *Recreational Drugs Use, Alcohol Misuse, Supplement Use, and High-Intensity Strength-Based Training.*

Recreational Drugs Use and Alcohol Misuse: In the first two themes, nobody thought of themselves as heavy recreational drugs users. Nonetheless, most of the participants had smoked cannabis and been involved in alcohol consumption while under the legal age to take alcohol. One interviewee said:

I never took anything much, not even drinking. I looked young and didn't want to get done [into trouble] for under-age drinking or something. I had some Es [ecstasy] at a music festival; everyone was at it there, so it seemed OK, part of the experience. We knew there was dodgy stuff about, but you still took it (Female, 34).

Supplement Use: Consumption of nutritional supplements had been practiced by all 14 of the participants

prior to or leading to PIEDs use. A veteran provided an insight into behaviour that was not uncommon in the cohort:

Like everyone I know, I have taken supplements almost since I started serious weights [weight-training]. It began with taking shakes [powdered drinks] for recovery and then I experimented with different protein powders, mainly whey, casein, and soy milk, as well as glutamine. After a while, the guy that I got them from in the gym suggested taking gear [PIEDs] (Male, 38).

High-Intensity Strength-Based Physical Training: The final theme in this category reflected the role that intense physical activity had on military veterans. This form of physical training was commented on by almost all interviewees (n=13), highlighting that their desire to do more training at higher intensities was important in their PIEDs journey:

I felt I wanted to do more and more and once I was taking the gear was able to go on for ever. [In] fact I increased my time in the gym from about 70 mins a night to nearer 3 hours but taking them also allowed me to use my time and keep lifting (Male, 26).

GATEKEEPERS

Analysis of data identified that gatekeepers consisted of three key groupings: friends or peers as gatekeepers (n=14); work colleagues (n=14); and leaders or mentors (n=10) (Figure 2). Their influence was strong.

This GD consisted of two categories: Procurement of PIEDs and Information Dissemination

Procurement of PIEDs

This category comprised of two 2nd Order Themes: Supplier of PIEDs (consisting of two 1st Order Themes), and *Facilitator* (consisting of three 1st Order Themes).

Suppliers of PIEDs: Suppliers were categorised in two ways. They were either *Direct* (suppliers) or they worked as *Intermediaries*. This was reflected in the statements with most of the respondents initially getting their supplies from someone, directly connected with them, usually a peer or work colleague, but then often moving on to intermediaries through whom PIEDs could be ordered:

My first lot of PIEDs were bought from one of the guys in the gym that I used. I worked out a bit with him and he told me they were part of his own supply and to try them out. After a bit [some time] of experimenting he told me who he used in Newcastle to get his stuff. That guy got his gear from suppliers in Manchester or Leeds, so I never went direct just through him. It gave me a feeling of security as he knew most of the guys and had been the dealer for ages [years] (Male, 38).

Facilitators: *Guides*, *Influencers*, or *Directors* were the classifications that made up this 2nd Order Theme, with differences being related to roles undertaken. *Guides* provided advice about what might be available and at what cost, while *Directors* indicated who to approach to purchase PIEDs. The roles were closely aligned as this comment from one participant attested: “My mates tell me what I need, how much, what it cost, and who to buy from” (Male, 26). *Influencers’* functions were related to making suggestions and encouraging others to take PIEDs. As with all of the *Facilitators*, *Influencers* came from one of the three groups of gatekeepers, and this is commonly noted in statements offered during interview:

I admired a lot of the more experienced men in the gym. They would help you, even if you didn’t ask. They would give tips about technique or help with support, and eventually I got to know them well and trust them and the probably started to trust me. So, they told me how to be able to lift more weight and do it quickly. (Male, 28).

Information Dissemination

This category related to the function of knowledge dissemination that focussed on two key areas, namely those related directly to PIEDs, *Information of PIEDs* and health related topics, *Medical and Health Issues*.

Information of PIEDs: This 2nd Order Theme consisted of three 1st Order Themes focussing on *Substance Choice*, *Quantity* (recommended for use), and *Quality of Substances*.

Substance Choice: All of our military veterans started taking PIEDs as novices and turned to peers, mentors, or work colleagues for information about what substances were needed for best results.

Other gym users and ultimately PIEDs users were the people that I asked for what to take when I was thinking of starting. (Male, 33).

Likewise, as they gained more experience of using PIEDs, our cohort also noted that they used the same people, or an extended network, to gather information about new drugs or trends.

We all talk to each other and when anything new is around we always ask around, in the gym and outside. A real network of knowledge, like a tree with branches everywhere [laughs]. (Male, 38).

Quantity: Similar comments were made with respect to the *Quantities* of PIEDs that should be used, with information again being passed via gatekeepers:

It's not quite hit or miss but it's not as though there are instructions with what I buy. The people I went to for info or listened to most were the lads I was working out with and who were using the same stuff, or who had used it in the past (Male, 33).

Quality: The quality of PIEDs cannot be guaranteed. Our respondents agreed that there was always some sort of risk attached to using PIEDs but acknowledged that they had to trust their gatekeepers and the information offered by them. This faith in a supply chain seemed the norm:

The idea that I am injecting some dodgy gear is always there, but I do my research before I try anything new and take advice from the older and more experienced guys in the gym. That's what we all do, talk to the others, and dig up [gather] whatever info you can about the drug and the supplier...and share it. What else can you do? (Male, 33).

Medical and Health Issues: This was the other 2nd Order Theme that fashioned the *Information* category. This theme consisted of two 1st Order Themes of *Method of Use* and *Problem Identification and Solving*.

Method of Use: The 14 participants were specifically questioned about the manner in which they used PIEDS, with all responding that they injected their drugs. Eleven indicated also that oral ingestion was used at times. However, all referred to initial needs for assistance with injecting. This assistance was usually from peers as opposed to seeking clinical advice or instruction:

My early experiences were by getting help from the lads in the gym. In fact, they injected it for me, showed me how to make it safe until I was ready to try for myself. Even then I had somebody watching me in case I made a mistake. They were as good as any nurse I've known which is just as well as I couldn't see me going to the surgery to ask them to inject me. (Male, 33).

Having been taught how to take their PIEDs, the veterans were given information how best to manage their consumption for best effect, and with a view to ensuring the process was as safe as possible. "Stacking", "pyramiding", "plateauing" and "cycling" are all methods employed regularly by PIEDs users to manage their intake.

One user intimated how he used his PIEDs and what influenced those decisions:

Once I had been taking things for a while, my best mate in the gym suggested that we chat to some of the older lads about how to manage and administer the doses as he read of different ways on the internet to make things safer and healthier. Now I usually stack my juice [PIEDs] taking two or three different types of drugs at a time for different reactions... all at the same time. I then come off that for a few weeks to let my body recover before trying what some lads call cycling where I took one drug, then after about six weeks move on to another, then same again with another drug. To stop the body getting used to it (Male, 33).

Problem Identification and Solving: When issues arise that can be considered as related to health or similar, it is to the same people that they turn:

I've tended to ask the guy that I get my supplies from as he has been there, seen it, done it, got the t-shirt. Like [for instance], when I was on nandrolone [a steroid] I was beginning to look fat and didn't know why or what to do. He told me to change [drugs] as it was water retention (Male, 34).

Similarly, another respondent said:

My first load were orals [steroids] but they were making me feel sick and some of the lads said they were too risky, so I changed to injections. I still take oral supplements even now but not the heavy stuff. (Male, 31).

DISCUSSION

This study identified two key influences associated with PIEDs use in our cohort of ex-Services personnel: *GATEWAYS* and *GATEKEEPERS*. This paper is not the first to identify their roles in multiple settings of substance misuse, however, there are a number of findings that are novel to PIEDs use compared with other areas of abuse (e.g. drugs, alcohol, abusive behaviour) and to military situations in particular. The “*gateway hypothesis*” has developed since the 1970s (Kandel, 2002). This proposes that acquaintance with what have been classed as “*entry*” substances such as alcohol, cigarettes, and cannabis, reliably predicts deeper and more severe drug use.

GATEWAYS seem not to be linked explicitly to psychological construct of motivation in the literature, yet the association seems unequivocal with gateways being cited as (a) occupationally derived, and (b) culturally driven through the environment in which users in are embedded, such as “*body-building gyms*”. (Coomber-Moore, 2017). These develop the needs on which PIEDs use is cultivated and fit well with our themes of *Work Demands* and *Gym User*. The third theme of *Overseas Deployment* is a theme that is military specific (Lui *et al*, 2018; Paisley, 2015; Varney *et al*, 2017). Ten of our interviewees indicated that they sought to appear tough or mean, to discourage approaches or aggression from others. With many of the respondents working in the security industry, preliminary thoughts were that this was based on participants' post-Services roles. However, further analysis identified a relationship between *Work Demands* and *Deployment*. *Deployment* offers both an access route to PIEDs as well as a rationale for taking the drugs. Access seemed relatively easy when deployed overseas, as UK Forces meet allied personnel, and in our context, work demands involved patrolling hostile environments while on active duty:

We were working and walking among locals not knowing whether you would be attacked by a hostile, so the bigger and meaner and tougher you looked the better it made you feel. Wouldn't have stopped an IED [improvised explosive device] but made me and some of the lads feel better...and anyhow, if not out on patrol, camp was boring, so you are actively encouraged to keep fit and the Yanks [American troops] showed us what to take and where they got it (Male, 44).

The data that contributed to the *Behaviour* category revealed that use of *Recreational Drugs Use* led to PIEDs use, despite all the veterans having previously taken recreational drugs. Despite this, they felt that there was no direct relationship between this and their PIEDs use, although their PIEDs consumption may indicate a broader acceptance of taking some drugs. Bandura's (2002) Theory of Moral Disengagement provides an explanation for this belief. His theory suggests that individuals accept unethical actions to justify other dubious behaviours. Thus, our participants saw no issues with taking recreational drugs, and concomitantly did not consider PIEDs use to be morally unjust (Boardley, Grix & Dewar, 2014).

Supplement Use involved different assumptions to those of recreational drugs users, with the main difference being that they recognised the links between taking legal supplementation and taking PIEDs. All participants stated they took nutritional supplements for training performance or body image benefits and the next stage for them was using PIEDs. This corresponds strongly with the PIEDs literature (e.g. Yager & O'Dea, 2014). It should be noted that the UK Armed Forces is aware of this pathway and takes measures to counter such behaviour (British Army, 2013).

The final *Behaviour* that was thematically defined was that of undertaking *High-Intensity Strength-Based Physical Training*. While this is not an uncommon behaviour among PIEDs users in civilian communities, the military provides other challenges that are related to *Work Demands*. Intense training takes place to prepare the military for combat and failure to cope may have negative consequences for careers. This influences the moves to seek assistance from peers and may lead to PIEDs use as a training aid. Similar findings have been detailed with the US military (Herbst, McAslin and Kalapatapu, 2017; Jacobson *et al* (2010)), highlighting an issue that may be culturally specific to military environments. Further investigation is suggested to ensure that Armed Forces personnel are not (actively or passively) "encouraged" to look for support or help outside the boundaries of military norms.

GATEKEEPERS are controversial figures in much of the literature, particularly in medical texts, where general practitioners and primary care specialists prescribe to special services, diagnostic testing, and hospital visits or admissions, and, as such, are acting as gatekeepers (Greenfield, Foley & Majeed, 2016). Gatekeepers also tend to be holders of information, often viewed as experienced persons who can either hold back information or provide it to others with the added value of perceived wisdom (Metoyer-Duran, 1993).

In our study, gatekeepers had strong "helpful" roles, rather than acting as blockages. Our analysis identified that gatekeepers were composed of three distinct but often related groups of people: friends or peers, work colleagues, and mentors or leaders (e.g., physical training instructors; fitness leaders). All had a role to play in either the procurement of PIEDs or in providing information about substances, their use, and related medical issues, irrespective of whether the veterans began taking PIEDs as serving or non-serving personnel. This concurs substantively with Coomber & Moyle's (2014) and van de Ven's (2017) research which identified that peers, friends, or other, context specific, individuals (such as other gym users or associates of friends in gyms) are most commonly involved in the acquisition of PIEDs.

GATEKEEPERS as a dimension was derived from two categories of *Procurement of PIEDS* (from 2nd Order Themes of *Supplier* and *Facilitator*) and *Information Dissemination* (from 2nd Order Themes of *Information About PIEDs* and *Medical and Health Issues*).

With new users particularly, the *Procurement of PIEDs* necessitated that gatekeepers took on two distinct roles as either *Facilitators* or *Suppliers*. As stated earlier, *Suppliers* were denoted as being either *Direct* or

Intermediary reflecting the fact that some gatekeepers provided PIEDs to users and were viewed as the “go-to” person in their gyms, whereas intermediaries acted on their behalf, almost as allies or collaborators acting as “go-between” in the supply chain. Irrespective, all users put a great deal of faith in their suppliers. This “blind faith” corroborates the findings of van de Ven and Mulrooney (2017; 2020) in Netherlands and Belgium, and Australia respectively, who learned that users of PIEDs implicitly trusted their suppliers.

Facilitators were considered to have one of three distinct functions, namely *Guide*, *Influencer*, and *Director*, a novel attribution. *Guides* were deemed to be gatekeepers who suggested, what PIEDs to take, when to take them, and how to take them. *Influencers* roles generally preceded the decision to take PIEDs, but it was definitely an active role, the purpose of which was to persuasively encourage engagement with PIEDs. Andreasson & Johansson (2014) noted that these influential roles are similar to those undertaken with both recreational and performance and image enhancing drugs users in the general population. The *Director* differentiated from the *Guide* in both focus and control insofar as a *Director* undertook their role once the decision to take PIEDs had been reached, informing the user of who to approach or where to go for their PIEDs. While the people who undertook the roles were at times entwined, their functions seemed to be quite discrete and is a further another novel finding of this study. Further work is needed to consider those roles and their relationships.

The final category reflected the *GATEKEEPERS’* role of *Information Disseminator*. Two distinct areas were developed: *Information about PIEDs* and *Medical and Health Issues*.

The former consisted of three themes: *Substance Choice*, *Quantity (of PIEDs to be taken)*, and *Quality (of PIEDs)*. The three areas were again discreet though closely aligned. What the results indicated is that gatekeepers, be they *Facilitators* or *Suppliers*, were trusted to ensure that the correct substances were being purchased for specific outcomes, that the users were taking them in appropriate quantities, and that the quality was “pure”. Participants trusted that standards were sound, unlaced and free of toxins, and were supplied in appropriate doses. Our veterans were unaware of whether their purchases were safe but simply trusted their supply chains (Coomber *et al*, 2014). Their gatekeepers “led” them through the maze of what drug to take, from among the many available. While there were recognised dangers of acquiring information, knowledge, and practices from non-clinical sources, there was a final thematic area that was drawn from the data, namely *Medical and Health Issues*.

Method of Use (including technique) is an important theme in health terms, recognising that most of the users employed intra-muscular injections to administer their PIEDs, and were taught injection protocols and techniques by friends, peers, or other users.

In terms of managing consumption, participants employed a number of key methods, and again they got the information from other users. These included relatively dangerous behaviours, such as “plateauing” in which doses are increased incrementally over a period of approximately two months with the aim of overcoming the body’s natural adaptation to PIEDs.

Despite the potential for negative health outcomes, they are still employed by our participants, and they gained their knowledge about how to do so from their gatekeepers. Also, in common with PIEDs users from the general population (see Tighe *et al*, 2017; Zahnnow *et al*, 2018), general advice from sources such as body-building magazines and internet forums, was used by our participants.

Problem Identification and Solving covered areas of concern and resultant strategies or support to deal with them. Within our cohort, information around medical issues were also garnered for the same sources, instead of accessing suitable medical personnel. The engagement with such sources for medical concerns is normal among PIEDs users (Andreasson and Johansson, 2014; Clement *et al*, 2012). Nonetheless, given the possible negative consequences on health, it is disquieting to realise that they are the principal options followed by PIEDs users when seeking information, advice, possible medical therapies or other interventions.

Responses to our questioning showed that a minority of interviewees (N=5) accessed clinical support, highlighting the normality of PIEDs users to avoid seeking medical opinion whenever possible. It seems that PIEDs users do not trust their Forces medical staff due to an awareness that medical staff are senior figures in the Armed Forces. A comment from one veteran supports this view: "Well you can't really, can you? They're part of the "brass" [senior staff]. They'll shop [inform on] you!" (Male, 26).

GATEKEEPERS were viewed by our participants as being the most important people in their journey of PIEDs use, using them to access the drugs, train them on how to use them, and as sources for knowledge, information, and contacts. In the context of this study, gatekeepers were fundamentally other gym users who introduced and then supported PIEDs users. This was especially so in the early days as users. It was noted that gatekeepers had multiple roles:

My main man [for supply and information] is the guy that I knew in the Forces who was able to get gear from his mates in Liverpool. Anything that I need to know, I go to him. If he doesn't know, he finds out (Male, 44).

In spite of their experiences of negative health consequences, such as injection-site or blood infections, our participants followed the same paths of recreational drug addicts in mainstream society by continuing to use the same suppliers, products, and behaviours (Binswanger *et al.*, 2012).

CONCLUSION

This work amongst former military personnel found similarities with other studies of PIEDs' studies with similar cohorts. There were also similarities found with the results of PIEDs' studies in wider populations. These included the manner in which users were first introduced to performance and image enhancing drugs as well as the gatekeeping roles of "*significant others*" in accessing information. Also noted are features of PIEDs use among Services personnel that require additional exploration. These include factors that might reflect adverse influences by colleagues, the "*masculine*" culture that is inherent within military life, the excessive demands on recruits and regular personnel alike during military physical training sessions, as well as the physical and psychological requirements of active service in foreign lands.

This paper addresses the issues of gateways and gatekeepers in PIEDs use among a small cohort of former military personnel. As such, it is the first paper that has specifically considered the two areas and attempted to map them, albeit independently of each other. Given the apparent importance of both *GATEKEEPERS* and *GATEWAYS* to PIEDs use, further knowledge must be gained. As such, there are two main recommendations that fall out of this work. The first is a call for further research of these topics to build and test a model that identifies where the interactions sit between gatekeepers of varying backgrounds, the roles they undertake, and the relationships with gateways. Secondly, in an effort to inform treatment options and initiatives to promote harm reduction, van den Ven & Mulrooney (2017) argued that the design of interventions to counter PIEDs use should, follow a holistic evaluation of social,

economic, and cultural factors that play a part in the decision to take drugs, as well as the environments and people that facilitate the practice. We support this recommendation as it is of particular significance to the Armed Forces where the values and intense training seems to foster a culture in which the rewards of PIEDs use outweigh the risks.

While much of this study reinforces concepts and practices from other areas of substance abuse or anti-social behaviour, our findings have also identified a number of key issues that have thus far been unrepresented in the literature surrounding the use of PIEDs. The fact that this work has been conducted with a small cohort of ex-military personnel means that it cannot be considered to be representative of PIEDs users generally. This makes the topic one of significance for future research with larger samples in both competitive, vocational, and recreational settings. However, there are issues that are very specific to this present cohort which makes this study an important addition to the literature around the use of PIEDs in the Armed Forces. It supports and reinforces the need for greater knowledge.

AUTHOR CONTRIBUTIONS

Conceptualisation of project: Ian Whyte, Jonathan Ling. Literature review (including write-up): Emily Pattinson, Ian Whyte, Sandra Leyland. Data collection: Ian Whyte. Data analysis: Ian Whyte, Jonathan Ling, Istvan Soos. Write-up: Ian Whyte, Jonathan Ling, Istvan Soos (with Emily Patinson and Sandra Leyland being responsible for the literature review). Editing: all authors.

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