



Merchants Quay Ireland
Homeless & Drugs Services

Examining the Profile and Perspectives of Individuals Attending Harm Reduction Services who are Users of **Performance and Image Enhancing Drugs**



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who are Users of **Performance and Image
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Authors' Statement

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The authors do not endorse the use of performance and image enhancing drugs but acknowledge the self-determination of those who have made the choice to use. As such, the focus of the present report is on exploring this emerging trend and examining ways in which to address the associated risk of harms.

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Executive Summary

The present report presents findings from a research project undertaken by Merchants Quay Ireland (MQI).

The evidence emerging from international studies points to a significant increase in the prevalence of individuals attending harm reduction services who are users of performance and image enhancing drugs (PIEDs). Given the indicators of a similar trend emerging in an Irish context, the rationale underlying the study was based on the recognition of the growing need to examine the profile and perspectives of such individuals attending services in Ireland.

The study employed a mixed method research design, with 89 clients of harm reduction services, who were users of PIEDs, completing a comprehensive survey. An overview of the nine primary questions, which the research aimed to address, is provided below, with a description of the main findings relevant to each question also presented.

What is the socio-demographic profile?

The average PIED user in the present study was approximately 27 years of age, although the age of participants ranged from 18 to 40 years old. All participants were male and significantly, no female PIED users presented during the period of data collection. While the sample was comprised of eight different nationalities, the vast majority were Irish nationals (90%). The dominant ethnic/cultural background was White Irish (80.9%), with few participants reporting Black or Asian backgrounds. Most of the participants reported a heterosexual sexual orientation (90.9%). The most common categories of current accommodation status reported were parental home (41.6%) and private rented accommodation (38.2%), with almost 85% of participants residing in Dublin. There was a varied level of education completed among respondents with the most widespread levels of education completed being lower secondary (34.1%), higher secondary (22.7%) and third level non-degree (20.5%).

Almost half of the participants (48.9%) were currently unemployed and just under a fifth (20.7%) were in full-time employment.

What are the motivations for PIED use and the history of use?

Among the most prevalently reported motivations for PIED use were to increase muscle mass (91%), to increase strength (75.3%), to look good (62.9%) and to increase confidence (51.7%). Almost all participants (96.6%) reported lifetime injecting use of anabolic-androgenic steroids (AAS), with the average age of initiation being approximately 24 years old. The youngest onset

of injecting use was sixteen years old and the oldest was thirty-nine years.

Approximately 69% of participants reported lifetime use of oral AAS. The average age of initiation was approximately 23 years old, with the age of first use ranging from 15-36 years. In terms of the trajectory of AAS use; the most commonly reported sequence was "starting using oral steroids and then progressed to injecting steroids" (38%).

What is the nature of PIED use and trends in PIEDs use?

There was a wide spread in terms of the number of cycles of PIED use respondents had undertaken over their lifetime. Just under half of respondents were on either their first cycle or second cycle of PIED use. Almost a fifth of respondents had completed five or more cycles (18%). The most commonly reported length of usual cycle was 6-8 weeks (29.2%). However in just over 10% of cases, the length of usual cycle was more than seventeen weeks. In terms of the AAS being used; while respondents reported current and past use of a wide variety of AAS, Testosterone (single/multi esters) was by far the most prevalently form of AAS used during current cycles (84%) and previous cycles (77.5%). Other commonly used AAS previously/currently included Nandrolone decanoate and Trenbolone acetate. In terms

of the use of ancillary compounds and post cycle treatment drugs; the substances being used most prevalently during current cycles included Creatine (23.9%) and Aromatase Inhibitors/Anti-Oestrogens (10.1%). Substances which had been most commonly used during previous cycles included Creatine (37.5%), HCG (27.2%), Clenbuterol (25.8%), Aromatase Inhibitors/Anti-Oestrogens (24.7%), and Clomiphene citrate (21.3%).

What are the side-effects experienced in association with the use of PIEDs?

Participants described experiencing a broad range of side-effects in association with their use of PIEDs. Prominent side-effects which had been previously experienced included increased appetite (49.4%), increased sex drive (46%), water retention (44%), increased aggression (38.2%), growth of excessive body hair (36%), acne (36%), sudden mood changes (31.5%), testicular atrophy (29.2%), decreased sex drive (33.7%), insomnia (23.6%), muscle/joint pain (22.5%), anxiety (19.1%), and depression (18%). Although cited with less frequency, participants reported currently experiencing a range of side-effects similar to those above.

What are the patterns of poly-substance use?

Participants reported the use a wide variety of substances within their lifetime, with alcohol (95.5%), tobacco (71.6%), cannabis (68.2%), cocaine (56.8%), and benzodiazepines (35.8%) showing the highest levels of lifetime use. It is also noteworthy that a small number of participants reported having ever injected heroin (11.4%), cocaine (5.7%), and new psychoactive substances (2.3%). Recent use (within the past month) of other substances was also frequently reported. Again, alcohol (62.5%), tobacco (52.3%), cannabis (39.8%), benzodiazepines (22.7%), and cocaine (17%) were the substances with the most prevalent recent use.

What is the training and exercise profile?

Almost all participants reported that they were engaged in a regular training and exercise programme, with over 85% stating that exercised four or more days a week. In terms of type of training and exercise, 91% of participants reported participation in weight training and approximately 80% of participants reported participation in cardiovascular exercise. Approximately 46% of participants reported participation in organised sport, with the most prevalently reported categories being bodybuilding (15.7%), boxing (10.1%), and soccer (10.1%).

What are the injecting practices?

The majority of respondents (55%) had learned to inject from other PIED users, while just over 30% of participants had learned to inject either through a harm reduction service or medical professional. While intramuscular injection was the most popular method of injection among respondents, subcutaneous injection was also reported. Injection in to the buttocks was by far the most prevalently used site, with deltoids and quadriceps being the next most frequently used injecting sites. Respondents had experienced a range of injecting related injuries, with muscle pain (47.5%) and bruising (37.5%) among the most commonly cited. In terms of the physical environment of injection; 80% of respondents reported that they always injected at home, whereas 2% reported that they always injected at the gym. In terms of the social environment of injection; over half of the respondents always injected alone, whereas 25% always injected with others. In terms of the administration of injection; 71% of respondents were always injected by another person and 16% always injected themselves. The majority of respondents stated that they had never reused (84%), lent (95%), or borrowed (98%) used needle or syringes.

What are the levels of testing for blood-borne viruses (BBVs), prevalence of BBVs, and uptake of treatment for BBVs?

While approximately a third of participants had last been tested for HIV in the past 12 months, just under half of respondents had never been tested. Of those respondents who had been tested for HIV, there were no reports of a positive status. Similar results emerged concerning testing for Hepatitis C, which again illustrated that while almost half of respondents had never been tested, approximately a third had been tested within the past year. However, there were reports of positive cases, with 4.6% of the overall sample indicating that they had tested positive for Hepatitis C. When framed in terms of participants who had been tested and knew their result; positive statuses represented approximately 10% of respondents. All participants who reported being positive for Hepatitis C also had a past history of injecting psychoactive drug use. Results pertaining to the treatment status of participants who had tested positive for Hepatitis C indicated that they had either completed treatment, were awaiting treatment or further tests, or had declined treatment. Just under half of participants had ever been tested for Hepatitis B, with approximately a third having last been tested within 12 months. There were no reports of a positive status for Hepatitis B and just over a third of respondents had been vaccinated against the virus.

What are PIED users' perspectives on harm reduction services?

Overall, participants described their interaction with harm reduction services in positive terms and articulated that services were particularly useful for accessing sterile injecting equipment and information relating to PIED use. That being said, service users also stated that the presence of users of other psychoactive substances within harm reduction services and needle exchanges created an intimidating atmosphere, which made them feel uncomfortable. In terms of

service provision, the primary desire expressed by respondents was for a separate, specialised service which catered for their medical needs and was dedicated exclusively to PIED use. Other suggestions for service provision included having more information on steroids, information available in other languages, more advertisement of the service, longer opening hours, and a supervised injecting room.

Based on an evaluation of these findings in the context of previous studies, a number of key recommendations were proposed:

RECOMMENDATIONS FOR PRACTICE

- As a group, users of PIEDs represent a minority at harm reduction services. The increasing prevalence of attendees, who are using such substances, means that harm reduction service providers, and indeed drug and health services in the wider context, should expect to interact with this group.
- PIED users are a diverse group of individuals. Service providers should anticipate diversity among attendees who are users of PIEDs and endeavour to provide accessible, inclusive and culturally competent services, which recognise the issues facing individuals.
- The trend of users of PIEDs attending harm reduction services is a relatively new phenomenon and represents a major transition in the client base of such services. Professionals engaging with PIED users face several challenges in catering for the needs of this group, and therefore, the provision of specialist training and education is particularly necessary.
- Given the range of personal and public health concerns associated with the use of PIEDs, the need for harm reduction approaches to be integrated within a continuum of care is readily apparent.

Interventions designed to minimise the risk of harm should include the provision of sterile injecting equipment, BBV testing and vaccination, and health services, as well as harm reduction education and advice on BBV infections and vaccinations, use of PIEDs, associated side-effects, injecting techniques, risk behaviours, diet and training, use of other illicit substances, and sexual health.

- Existing harm reduction services are traditionally geared towards users of psychoactive substances. Given the divergent profile and nature of substance use among PIED users, there is a need to develop a tailored approach in response to the profile of harm within this group. Expanding the range and nature of models of practice may serve to enhance accessibility, engagement, and effectiveness. In particular, the implementation and assessment of a specialised PIED clinic on a trial basis may be a beneficial development at this time.
- The use of PIEDs is associated with a wide range of adverse impacts, which may manifest in physical, psychological, and/or behavioural domains. The varied needs of this group require integrative, multi-disciplinary approaches to be considered, with emphasis on developing inter-agency links and establishing care pathways between general health services, harm reduction services, and mental health services.

RECOMMENDATIONS FOR RESEARCH

- The evidence base surrounding the worldwide prevalence of PIED use is gradually expanding. There is however a deficit of knowledge surrounding the epidemiology of use in an Irish context. As such, population based surveys, which examine the national prevalence of use among adults and adolescents, would shed light on the patterns of use and provide a basis for policy-making and planning.
- The findings of the present study may not be representative of the profile and perspectives of users of PIEDs, who are not attending harm reduction services. Future research, which samples the wider population of PIED users, would provide a more comprehensive portrait.
- Findings concerning BBVs in the present study were based on self-report. In order to ascertain a definitive prevalence, future research which incorporates serological testing is recommended.
- In depth qualitative research would provide a deeper understanding of the experience and perspectives of PIED users, and would further facilitate the elicitation of their views regarding appropriate service provision.
- Future research exploring the perspectives of healthcare and harm reduction professionals would identify the challenges associated with engaging with PIED users and assess the feasibility of developing integrative, multi-disciplinary approaches.
- Research surrounding the effectiveness of existing harm reduction service provision within an Irish context is required to evaluate the capacity of services to minimise the harms associated with the use of PIEDs.
- Service provision in Ireland, and indeed internationally, appears to be hindered by the lack of public health policies and practice guidelines relating to the use of PIEDs. Research in this area is essential in order to inform policy and equip services with the infrastructure and tools necessary to provide effective interventions.

THE FINDINGS OF THE PRESENT STUDY MAY NOT BE REPRESENTATIVE OF THE PROFILE AND PERSPECTIVES OF USERS OF PIEDS, WHO ARE NOT ATTENDING HARM REDUCTION SERVICES.

Chapter 1: Review of Literature

The initial chapter of this study sets out the contextual landscape which underlies the present research. An overview of the research problem is presented and key concepts within the topic of study are outlined. Following these introductory sections, the extant empirical literature surrounding harm reduction and the use of performance and image enhancing drugs (PIEDs) is explored. At the conclusion of the chapter, the research context is described and the specific research questions of the present study are outlined.

1.1. OVERVIEW OF THE RESEARCH PROBLEM

During the course of the past three decades, harm reduction approaches have gradually emerged as a central pillar of international drug strategies, and are currently endorsed in policy or practice in approximately ninety-seven countries and territories worldwide (IHRA, 2012). Within the spectrum of harm reduction services, needle and syringe programmes (NSPs) play a significant role in minimising harm arising from injecting drug use (Wodak & Cooney, 2004). In recent years, there has been a marked increase in the prevalence of individuals attending NSPs who are users of PIEDs. This trend has been documented internationally (Iversen, Topp, Wand, & Maher, 2013; McVeigh, Beynon, & Bellis, 2003; Rich et al., 1999) and there are noticeable indicators of a similar trend emerging in an Irish context (Jennings, 2013; Robinson, Gibney, Keane, & Long, 2008). Although the level of harm associated with the use of PIEDs is generally less overt when compared to the risk associated with the use of psychoactive substances (Aitken, Delalande & Stanton, 2002; Day, Topp, Iversen, & Maher, 2008), there are growing concerns around the use of PIEDs and related physical and psychological harms (Evans-Brown & McVeigh, 2008; Hope et al., 2013). Harm reduction services are faced with several challenges in attempting to respond to the expanding range of client needs, and in spite of an anecdotal

awareness surrounding the increase of PIED users accessing Irish services; there is a paucity of empirical investigation addressing this emerging trend.

1.2. DEFINING KEY CONCEPTS

As a prelude to exploring the context in which the present study is engaged, an examination of the key concepts is necessary both to ground the focus of the study and to specify the definitional position this research adopts. As evidenced in the previous section, the key concepts which underpin the present study are *performance and image enhancing drugs* and *harm reduction*.

1.2.1. Performance and Image Enhancing

Drugs. Within the literature surrounding the non-medical use of substances which may be used to enhance aesthetics and/or performance, much of the research (e.g., Aitken et al., 2002, Midgley et al., 2000, Peters, Copeland, & Dillon, 1999) has conventionally focused on the use of anabolic-androgenic steroids (AAS). Traditionally, such substances were generally termed as performance-enhancing drugs (PEDs), used to describe the range of substances that could have performance benefits for elite athletes (Larance, Degenhardt, Dillon, & Copeland, 2005). While AAS remain the most prominently used substances of this kind, there is an increasing diversity in the prevalence, profile, and motivations of individuals who use AAS in conjunction with related substances such as peptides, tanning drugs, hormones, and weight loss agents (Hope et al., 2013). To reflect these emerging heterogeneous variables, much of the contemporary literature incorporates umbrella terms such as “performance and image enhancing drugs” or “image and performance enhancing drugs” (e.g., Dennington et al. 2008; Iversen, et al., 2013).

In an effort to encompass the diverse range of substances, the breadth of associated utilities, and the divergent motivations of users, the current study adopts the term

performance and image enhancing drugs, which is defined as substances that are used to enhance performance (e.g. improving strength and/or endurance), improve the body's appearance (e.g. increasing muscle size and/or reducing body fat), mask the use of performance-enhancing drugs to avoid drug testing, and to manage the negative side effects of substance use. Similar definitions also appear in previous studies (e.g., Dennington et al., 2008, Larance, et al., 2005).

1.2.2. Harm Reduction. Emerging in the early 1970s in response to the heightening awareness around the public health concerns related to substance use, harm reduction represented a dramatic and controversial paradigm shift in drug policy. While previous models of addressing drug issues had predominantly concentrated on prevention, control and abstinence, harm reduction approaches focus on minimising drug related harm (Ritter & Cameron, 2005). Accordingly, the philosophy of the harm reduction model pragmatically accepts that drug use is a prevailing reality and acknowledges the self-determination of those who choose to use drugs.

However, while the reduction of harm may be delineated as the focal objective, the notions of abstinence and harm reduction are not considered mutually exclusive or dichotomous extremes. Indeed, contemporary visions of harm reduction conceptualise it as a “combination intervention” that is comprised of a variety of interventions adapted to the diversity of settings, systems and populations in which it is operationalised (Rhodes & Hedrich, 2010). The present study draws from this conceptualisation outlined by Rhodes and Hedrich (2010; p. 19) and defines *harm reduction* as “interventions, programmes and policies that seek to reduce the health, social and economic harms of drug use to individuals, communities and societies”.

1.3. LITERATURE REVIEW

The adoption of harm reduction approaches in Ireland emerged in the late 1980s, whereby needle exchange programmes and outreach services were introduced, in response to the identification of persons who inject drugs (PWIDs) as a high risk group for contracting and transmitting blood-borne viruses (BBVs) and the corresponding risk to public and personal health (Butler, 1991). Shortly thereafter, harm reduction approaches were endorsed on a policy level by the

Government Strategy to Prevent Drug Misuse (1991) and have remained a consistent feature of Irish drug policies for more than two decades. Harm reduction represented a primary pillar within the National Drugs Strategy outlined in *Building on Experience 2001-2008* and is further advocated in the *National Drugs Strategy (Interim) 2009-2016*.

NSPs are recognised internationally and domestically as a key component of interventions designed to minimise drug related harms and often act as the first point of contact for drug users, facilitating initial connection with drug services in a non-judgmental interaction (Kuo et al., 2003). Specifically, NSPs aim to engage with PWIDs and attempt to limit the prevalence of BBVs through the provision of sterile injecting equipment, as well as offering education around the risks associated with drug use, providing access to health services, and opening referral pathways in to drug treatment (Cox & Robinson, 2008).

In the past, NSPs were traditionally geared towards users of psychoactive substances such as opiates. However, evidence from the international literature indicates that users of PIEDs appear to be an increasing subgroup among NSP attendees. While this may not necessarily be indicative of an overall increase in use of PIEDs within the general population, it does highlight the fact that a considerable amount of individuals are using

these substances, and moreover, speaks to a significant trend within the domain of harm reduction (McVeigh et al., 2003). A recent study based in Australia, highlighted that the prevalence of PIED injectors attending NSPs in Queensland and New South Wales rose from 2.4% in 2010 to 4.6% in 2011 (Iversen et al., 2013). Evidence points to a similar trend in the United States (e.g., see Rich et al., 1999) and the United Kingdom, where Evans-Brown & McVeigh (2008) reported a 2000% increase in the number of steroid injectors attending NSPs based in Merseyside and Cheshire between 1991 and 2006. In Ireland, almost two-thirds of NSPs have reported the presence of clients who are injecting PIEDs (Robinson et al., 2008) and a recent study in a Dublin based NSP indicated that approximately 7% of a sample of attendees were steroid users (Jennings, 2013). Overall, the results emanating from international and domestic studies suggest that although there is a substantial rise in the prevalence of PIED users attending NSPs, they remain a minority within the overall client base. In light of their marginal profile, there is the risk that the needs of this group are not currently being wholly met in harm reduction services (Larance, Degenhardt, Copeland, & Dillon, 2008).

Viewed within a wider framework; PIED users are also typically overlooked within public health initiatives (Larance et al., 2008). In an Irish context, while there has been recent deliberation surrounding the application of amended legislative controls (Department of Health, 2013), there has been little consideration afforded to the use of PIEDs within any of the major Irish public health policy documents such as the *National Drugs Strategy (Interim) 2009-2016*, the *National Hepatitis C Strategy 2011-2014* or the *National Drug Rehabilitation Implementation Committee* protocols (NDRIC; Doyle & Ivanovic, 2010). Given the lack of current policy based recommendations and the low coverage of specialist service provision, there is the indication that the developing trend

concerning PIED use in Ireland is being relatively overlooked.

In addition, there is a severe paucity of germane research relating to PIED use in Ireland. However, looking to the wider literature, there is a growing number of international studies which have examined the phenomenon of PIED use. Within the following sections, the empirical research surrounding users of PIEDs, with an emphasis on a harm reduction perspective, is reviewed in a number of areas: socio-demographic characteristics of PIED users, use of PIEDs, use of other substances, injecting practices and BBVs, and the interaction between PIED use and harm reduction services.

1.3.1. Socio-demographic

characteristics. Traditionally, the non-medical use of performance enhancing drugs such as anabolic-androgenic steroids (AAS) was primarily associated with elite athletes and professional bodybuilders (Yesalis & Bahrke, 1995). However, in the contemporary landscape, elite athletes using PIEDs to enhance performance represent a small minority (Bahrke & Yesalis, 2004), with most PIED users being recreational and non-elite athletes whose motivations are geared more towards increasing strength, building muscle mass, and improving physical appearance (Aitken et al., 2002; Cohen, Collins, Darkes, & Gwartney, 2007). As such, the socio-demographic profile of individuals using PIEDs has become increasingly diverse.

A synthesised summary of the variable of age, in studies concerned with PIED use, is portrayed in Table 1. Although this table does not offer a comprehensive review of studies, and does not include population/school based surveys, it does provide a useful overview of the previous findings concerning the age of PIED users, particularly in the context of harm reduction services. While in some countries such as the United States, Scandinavia, Australia and Canada there has

been considerable research attention and public concern in relation to adolescent AAS use, with some studies suggesting a higher prevalence of use among adolescents when compared to the general population (Dunn & White, 2011; Pallesen, Josendal, Johnsen,

Larsen, & Molde, 2006), much of the wider literature has focused on adult PIED users. The selected studies in Table 1 highlight that the age of participants across studies have ranged from 17 to 79 years old, with the average age of PIED users ranging from

twenty-seven to almost thirty three years old. In terms of individuals accessing NSPs, studies suggest that PIED users are more likely to be younger when compared to other populations of injecting drug users (Day et al., 2008; Jennings, 2013).

TABLE 1

Overview of Age and Gender Variables in Studies of PIED Users

Study	Location	Participants (gender)	Age Range	Mean Age	Median Age
Crampin et al., 1998	England and Wales	149 AAS injectors (2 female) recruited through Anonymous HIV Prevalence Monitoring Survey self-completed questionnaire	17 – 48 years	—	25 years
Peters et al., 1999	Australia	100 AAS users (6 female) recruited through gyms, needle exchanges, & magazines completed questionnaire (both self-report & interview)	18 – 50 years	29.2 years	27 years
Aitken, et al., 2002	Victoria, Australia	63 PIED injectors, (9 female) recruited from Steroid Peer Education Program completed questionnaire	21 – 60 years	—	31 years
Cohen et al., 2007	United States	1,955 (all male) adult non-medical AAS users recruited online completed an internet based survey	18 – 76 years	31.1 years	29 years
Day et al., 2008	New South Wales, Australia	318 PIED injectors (12 female) recruited from NSP Survey participants during the years 1995 – 2004 self-completed questionnaire	—	27 years	—
Larance et al., 2008	New South Wales, Australia	60 (all male) PIED users recruited through advertisement completed face-face interview	17 – 59 years	32 years	—
Hope et al., 2013	England and Wales	395 (all male) PIED users recruited from across 19 NSPs self-completed questionnaire	—	<25 27% 25-34 34% ≥35 27% No report 12%	28 years
Jennings (2013)	Ireland	25 (all male) AAS users sampled from NSP attendees completed face-face questionnaire	21 – 43 years	28.84 years	—
Chandler & McVeigh, 2014	United Kingdom & Ireland	94 PIED users (15 female) recruited through online forums and NSPs completed an internet based survey	16 – 56 years	32.5 years	—

In terms of gender; research has consistently demonstrated a significantly higher level of PIED use among males. A recent global epidemiological study estimated a lifetime prevalence rate of AAS use of 6.4% for males and 1.6% for females (Sagoe, Molde, Andreassen, Torsheim, & Pallesen, 2014). Although there are variations in estimates, a comparable pattern of elevated lifetime and recent AAS usage amongst males have been found internationally across population based surveys (Australian Institute of Health and Welfare, 2011; NACD, 2012), college student surveys (Berning, Adams, Stamford, & Finewman, 2004; McCabe, Brower, West, Nelson, & Wechsler, 2007), and secondary school based surveys (Dunn & White, 2011; Hibell et al., 2011; Lorang, Callaghan, Cummins, Achar, & Brown, 2011; Pallesen et al., 2006). Table 1 illustrates that studies which have recruited samples of PIED users through online advertisement or education programmes, have attracted an overwhelming majority of male participants, and research within the context of NSPs also show a vastly higher concentration of male participants

(see "Participants" column in Table 1). A number of studies have also demonstrated that PIED users attending harm reduction services are significantly more likely than other drug using attendees to be male (Day et al., 2008; Iversen et al., 2013). Given the convergence of evidence noted above, the indicators suggest that while a proportion of PIED users are female, PIED use tends to be a predominantly male phenomenon.

Additional socio-demographic variables of interest in the domain of PIED use include sexual orientation, occupation, level of education, and socio-economic status. Sexual orientation has received particular research attention with a number of studies showing; as much as one third of respondents being men with a homosexual/bisexual orientation (e.g. Larance et al., 2008; Peters et al., 1999), high levels of AAS use among homosexual male gym goers (Bolding, Sherr, & Elford, 2001), and higher prevalence rate of lifetime AAS

misuse among adolescent homosexual/bisexual boys when compared to their heterosexual peers (Blashill & Safren, 2014). It has been suggested that the basis of such elevated prevalence of PIED use among sexual minorities may be linked to an enhanced emphasis on physical attractiveness and increased body image concerns within some sections of their culture (Larance et al., 2005).

Occupation has also been proposed as an influential socio-demographic variable, with the suggestion that PIED use may be perceived as beneficial in the execution of employment duties among certain occupations such as security personnel, door staff, fitness consultants, actors, bodyguards, fire fighters, and members of the armed forces (Maycock, 1999; Monaghan, 2002; Peters et al., 1999). Qualitative findings have described that while occupation may have a bearing on underlying motives; it is not an isolated factor, with PIED use in these cases stemming from a confluence of personal and occupational motivations (Dennington et al., 2008).

Thus, it has been put forth that the majority of PIED users are generally concerned with improving both their physical appearance and functioning (Peters et al., 1999).

In terms of level of education and socio-economic characteristics, a number of studies have found PIED users to be well-educated professionals, with samples showing high rates of employment and above average levels of income (Cohen et al., 2007; Dennington et al., 2008; Peter et al., 1999). However, alternative studies have reported variables such as relatively high level of recent involvement in crime (Larance et al., 2008). Such seeming incongruity is reflective of the general heterogeneity apparent in the socio-demographic profile of users of PIEDs across studies, and implies that although key socio-demographic characteristics such as gender, age, sexual orientation, occupation, level of education, and socio-economic status are useful markers, it is difficult to typify such a diverse group.

1.3.2. Use of PIEDs. Heightened awareness around the increasing prevalence of PIED use among a wider population within recent decades had led to the emergence of a significant evidence base exploring why individuals use, what the trajectory of use is, what substances are used, and how substances are used.

A recent synthesis of the body of qualitative research concerning the aetiology of AAS use summarised that factors such as participation in sports, maladaptive relationships, psychopathology, negative self and body image, deviant behaviour, and abuse of other drugs, were prominent features of users prior to initiation (Sagoe, Andreassen, & Pallesen, 2014). In terms of when adult users commence PIED use; single studies have found average age of initiation to be 25.1 years old (Peters et al., 1999), 25.8 years old (Cohen et al., 2007), and 24 years old (Larance et al., 2008), which would appear to support the epidemiological evidence that has estimated that approximately 80% of AAS users initiate use before the age of 30 years old (Pope et al., 2014).

Within the literature, much attention had been paid to the question of why individuals choose to use PIEDs, with users typically delineated in to three broad categories based on underlying motivation for use (e.g., see Evans-Brown & McVeigh 2008; Peters et al., 1999). These groupings of users have included professional athletes (those who use in order to enhance performance), occupational users (those who use in order to support/enhance occupational functioning), and body image users (those who use in order to improve physical aesthetic). Quantitative studies which have examined individuals motives report a range of motivations such as to improve physical appearance, to become stronger, to increase size, to enhance performance, to increase confidence, to decrease fat, and/or to improve mood (Aitken et al., 2002; Cohen et al., 2007). While motivations described within the qualitative literature support these principal motives, there is the indication that a further

range of more nuanced psychosocial elements including psychological well-being, family/peer influence, social status, and social norms, may also play a role in motivating and maintaining PIED use (Dennington et al., 2008; Sagoe, et al., 2014).

With regard to what substances are prevalently used; Larance and colleagues (2005) detail that PIEDs refer to a range of substances which are generally used to enhance muscle growth (anabolic effects) and/or to reduce body fat (catabolic effects). Within the spectrum of these substances, AAS (a group of drugs which include testosterone, the male hormone, as well as several synthetic

derivatives, which imitate male sex hormones) are the most prominently used, and widely investigated, form of PIEDs (Larance et al., 2005; Pope, & Bower, 2009). Such substances may have anabolic effects (promoting the development of muscle growth) and/or androgenic effects (promoting the development of male sex characteristics such as body hair, deepening of voice, development of male sex organs and sex drive). While the available evidence suggests that all forms of AAS possess both anabolic and androgenic properties, there are variances in ratio of these properties between different types of AAS (Larance et al., 2005).

Table 2 provides an overview of common types of AAS and illustrates the route of administration and primary effect of each type. While few empirical studies have detailed patterns of specific AAS use, Cohen and colleagues (2007) found that within their large sample of male adult PIED users, single ester testosterone (78.2%), methandrostenolone (64.9%), and nandrolone decanoate (63.5%), multi ester testosterone (56%), and stanozolol (56%) were the most commonly used agents. The available evidence also suggests that the use of injectable forms of AAS is generally more prevalent than the use of oral compounds (Hope et al., 2013; Larance et al., 2008).

TABLE 2

Overview of Common Types of AAS

Chemical Name	Brand Name(s)	Administration	Description
Boldenone undecylenate	Equipoise, Boldebal	Injection	Primarily Anabolic
Chlorodehydromethyltestosterone	Turinabol, Turanabol	Oral	Primarily Anabolic
Drostanolone Propionate	Masteron	Injection	Primarily Anabolic
Fluoxymesterone	Halotestin	Oral	Primarily Anabolic
Formebolone	Esiclone	Injection	Primarily Anabolic
Mesterolone	Proviron	Oral	Primarily Androgenic
Methandrostenolone	Dianabol, Anabol, Metanabol, Naposim	Primarily oral but also injectable forms	Primarily Anabolic (w androgenic properties)
Methenolone Enanthate	Primobolan	Injection	Primarily Anabolic
Nandrolone decanoate	Deca Durabolin, Extraboline	Injection	Primarily Anabolic (moderately androgenic)
Nandrolone laurate	Laurabolin	Injection	Primarily Anabolic
Nandrolone undecanoate	Dynabolon	Injection	Primarily Anabolic
Oxandrolone	Anavar	Oral	Primarily Anabolic
Oxymetholone	Anadrol, Anapolon	Oral	Primarily Anabolic
Stanozolol	Winstrol, Stromba	Oral & Injection	Primarily Anabolic
Testosterone Suspension, Esters & Blends (e.g. Cypionate, Propionate, Suspension, Undecanoate)	Testa C, Testoviron Sustanon, Andriol	Injection	Primarily Anabolic (different varieties of testosterone)
Trenbolone acetate	Trenbolone, Finaplix	Injection, Transdermal & Nasal	Primarily Anabolic
Trenbolone hexahydrobencylcarbonate	Parabolan	Injection	Primarily Anabolic

Note. Adapted from "Performance Enhancing Drugs Resource Pack" by K. Flemen, 2011.

The use of AAS has been associated with a host of adverse side-effects. Several authors have reviewed the evidence regarding these associated effects (e.g. Bahrke & Yesalis, 2004; Kanayama, Hudson, & Pope Jr., 2008, 2010; van Amsterdam, 2010), which are illustrated in Table 3. In spite of the evidence which indicates that AAS use may be associated with such adverse health effects, it should be noted that the knowledge base surrounding the prevalence and magnitude of these short-term and long-term effects is limited (Kanayama, et al., 2008). In particular, a consistent causal link between AAS use and the majority of adverse effects has not been well established, and related investigation in to

health effects is confounded by the diversity of variables such as the range of AAS substances used, dose, frequency, age of initiation, period of use, and use of other illicit substances (Bahrke & Yesalis, 2004). As such, several authors have suggested that the dangers of AAS use are generally overstated (Cohen et al., 2007; Evans, 2004). That being said, AAS users within the empirical literature typically report experiencing side-effects (Larance et al., 2005). Given the recent proliferation of use and the lack of longitudinal studies, it may be the case that the adverse public health consequences of long-term AAS use are being underestimated rather than overestimated (Kanayama et al., 2008).

THE USE OF AAS HAS BEEN ASSOCIATED WITH A HOST OF ADVERSE SIDE-EFFECTS

TABLE 3

Overview of Adverse Effects Associated with the Use of AAS

Cardiovascular effects	Hypertension (elevated blood pressure) Cardiomyopathy (heart disease) Myocardial hypertrophy (enlargement of the heart) Myocardial ischemia (decreased blood flow to heart due to blockage of arteries) Dyslipidemia (decreased high density lipoprotein and increased low density lipoprotein) Arrhythmia (irregular heartbeat) Thrombosis (blood clotting)
Hepatic effects	Jaundice Peliosis hepatis (development of multiple blood-filled cystic spaces in the liver) Hepatocellular hyperplasia (abnormal multiplication of cells in the liver) Hepatocellular adenomas (benign tumours in the liver)
Dermatologic effects	Acne Stretch marks Alopecia (hair loss)
Psychological effects	Depressive symptoms Hypomania/mania Dependence Personality disturbances Other psychiatric disorders
Behavioural effects	Increased aggression/violence
Male-specific effects	Gynaecomastia (abnormal enlargement of the male breast tissue) Changes in the male reproduction systems (which may include reduction in levels of endogenous testosterone, testicular atrophy, reduction in sperm count and sperm motility, and alterations in sperm morphology)
Female-specific effects	Menstrual abnormalities Deepening of the voice Shrinkage of the breasts Increase in clitoris size

While a number of the aforementioned side-effects may be permanent, some effects may be experienced temporarily whilst using AAS (Larance et al., 2005). As such, the nature of AAS use is typically cyclical, whereby users undertake periods of use, interspersed with periods of non-use, designed to facilitate the endocrine systems of the body to return to homeostasis (Cohen et al., 2007). Although there is little empirical clinical evidence supporting the notion that the practice of cycling may reduce the risk of adverse effects, or indicating ideal cycle length, users are generally guided by anecdotal evidence generated by previous experience, internet forums, or information websites (Chandler & McVeigh, 2014). Studies which have examined cycling show users differ significantly in the length of their cycles. An example of this variability is indicated in Cohen and colleagues (2007) wherein participants' cycle length ranged from 1 week to 728 weeks, with a median length of 11 weeks. This median length appears to be relatively consistent with that found in other studies (e.g., see Aitken et al., 2002; Larance et al., 2008).

Within this cycle of substance use, typical patterns suggest that in addition to AAS, PIED users may also use a number of ancillary compounds and/or post cycle treatment drugs. An overview of the range of

common auxiliary substances is outlined in Table 4. Such substances may be used in order to achieve anabolic or catabolic effects and/or minimise potential adverse side-effects. Studies show that although these substances appear to be used less prevalently than AAS, there is significant use of other hormones (e.g. human growth hormone), beta agonists (e.g. clenbuterol), stimulants (e.g. ephedrine), drugs for weight loss (diuretics), drugs believed to stimulate testosterone (e.g. clomiphene), and agents used to counteract unwanted physical side-effects (e.g. tamoxifen) among AAS users (e.g., see Chandler & McVeigh, 2014; Cohen et al., 2007; Hope et al., 2014; Larance et al., 2008).

In short, the features underlying the use of PIEDs appear to be an interconnected set of nuanced psychological, social, behavioural, and physical factors, with the predominant conscious motivations for use revolving around the size, shape, and performance of the body. Initiation of use typically occurs in the mid-twenties, with individuals using multiple steroids and ancillary substances in a cyclical fashion, with significant levels of injecting use occurring within this regime. A definitive portrait of the side-effects related to PIED use remains relatively unclear but users frequently report experiencing adverse health effects.

**A DEFINITIVE PORTRAIT OF THE
SIDE-EFFECTS RELATED TO PIED USE
REMAINS RELATIVELY UNCLEAR BUT USERS
FREQUENTLY REPORT EXPERIENCING
ADVERSE HEALTH EFFECTS.**

TABLE 4*Overview of Common Ancillary Compounds/Post Cycle Treatment Drugs*

Chemical Name	Brand Name(s)	Administration	PIED Related Use
Aromatase Inhibitors/Anti-Oestrogens (e.g. Anastrozole, Exemestane)	Tamoxifen, Arimidex, Letrozole	Oral	Used to block or inhibit the actions of oestrogen, and reduce risk of feminisation
Human Chorionic Gonadotrophin (HCG)		Injected	Used to stimulate production of testosterone in men and reduces risk of testicular atrophy
Clomiphene citrate	Clomid	Oral	Used to trigger natural testosterone production
Human Growth Hormone (HGH)	Somatropin	Injected	A synthetic compound of naturally occurring hormone with strong anabolic effects
Growth Hormone Fragment		Inject	A stabilised analogue of the growth hormone-releasing factor (GRF), used to build lean muscle while burning excess fat
Insulin	Humulin R	Injected	Pancreatic hormone which regulates blood-sugar levels used to increase the amount of glycogen transported to muscles
Insulin Growth Factor (IGF)	Somatomedin C	Injected	An analogue of the liver-produced substance Insulin Growth Factor, primarily used to increase burning of fat
Thyroid Agents	Thyroxin, Cytomel	Oral	Medication used to treat thyroid insufficiency, used to increase metabolism and burn fat
Clenbuterol	Spiropent	Oral	A beta-2 agonist used as a stimulant to aid fat burning and muscle definition
Ephedrine		Oral	A stimulant used to speed up metabolism and burn fat
Tanning Agents	Melanotan, Epitan	Injected	Used to increase amount of melanin produced
Diuretics	Aldactone, Lasix	Oral	Used to help reduce water retention and increase muscle hardness and definition
Creatine		Oral	Used to delay fatigue and aid recovery
Synthol		Injected	A mixture of fatty acids, alcohol and lidocaine which causes muscles to swell
Anti-acne medication	Accutane	Oral	Used to prevent or treat acne
Gammahydroxybutyrate (GHB)		Oral	Sedative/relaxant used to promote sleep and to stimulate natural production of growth hormone

Note. Adapted from "Performance Enhancing Drugs Resource Pack" by K. Flemen, 2011.

1.3.3. Use of other substances. In addition to examining the use of AAS and ancillary compounds, previous research has also investigated the levels of polydrug use among PIED users. Table 5 provides an illustrative example of the prevalence of use of other substances found in selected previous studies. Within the study by Peters and colleagues (1999), 14% of participants had ever injected an illicit substance other

than AAS, whereas 27% of participants in the study from Larance and colleagues (2008) reported having ever injected other illicit drugs. However, a comparative study conducted in Australia with a small sample found no significant difference between AAS users and non-users regarding use of illicit substances in the past six months (Dunn, 2009). Within a recent Irish study concerning attendees at a Dublin based harm reduction

service, 40% of AAS users sampled reported use of at least one other illicit drug within the past month (Jennings, 2013). In combination, while the results of the aforementioned studies suggest that a relatively high proportion of users of PIEDs also use other illicit substances, it remains unclear whether this pattern of polydrug use is within a problematic range.

TABLE 5
Overview of Studies Concerning Polydrug Use Among PIED Users

Study	Location	Participants	Drug Type	Lifetime Use (%)	Ever Injected (%)	Recent Use (%) ^{^*}
Peters et al., 1999	Australia	100 AAS users (6 female) recruited through gyms, needle exchanges, magazines	Marijuana	70	-	17
			Amphetamines	51	6	11
			Ecstasy	49	3	18
			Cocaine	43	4	5
			Hallucinogens	36	-	-
			Inhalants	20	-	4
			Heroin	9	5	1
Methadone	2	1	-			
Larance et al., 2008	Australia	60 male PIED users recruited through adverts	Cannabis	80	0	50
			Methamphetamine powder	78	20	31
			Crystal methamphetamine	53	17	28
			Ecstasy	77	8	56
			Cocaine	75	13	40
			Heroin	17	12	10
			Inhalants	45	0	15
			Benzodiazepines	8	2	8
Hallucinogens	45	5	3			

[^] In Peters et al., 1999 “recent use” was defined as one or more times per month

^{*} In Larance et al., 2008 “recent use” was defined as use in the last 6 months

1.3.4. Injecting practices and blood-borne viruses. Evidence from international studies highlights that a high volume of PIED users are injecting substances (e.g. see; Cohen et al., 2007; Hope et al., 2013; Larance et al., 2008). The World Health Organisation (WHO; 2010, 2012) outline that injecting drug use (IDU) has been consistently linked with the risk of blood-borne viruses (BBVs) such as human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV). Research over the past two decades has detailed that injecting risk behaviours, such as sharing of injecting equipment and paraphernalia, as the principal mechanism of contracting and transmitting BBVs (Cox & Robinson, 2008). Furthermore, IDU is associated with a number of additional health consequences such as bacterial infections, vascular damage and abscesses (Health Protection Agency, 2012). Traditionally, much of the attention around the risks of IDU has focused on persons who inject psychoactive drugs but given the increasing prevalence of PIED use, there are heightening concerns around the potential for BBV transmission and injecting related injuries among PIED injectors.

Looking to the literature, research has consistently found that when compared to psychoactive drug injectors, PIED users

engage in a much lower rate of injecting risk behaviours such as borrowing, lending or reusing used injecting equipment, or injecting with other people (Aitken et al., 2002; Cohen et al., 2007; Crampin et al., 1998; Day et al., 2008; Hope et al., 2013; Larance et al., 2008). Possible factors underlying this lower level of risk behaviours may include the lack of craving for AAS, the lower risk associated with intramuscular injection, and less frequent injection (Midgley et al., 2000). Given the long established link between injecting risk behaviours and the spread of BBVs, the safer injecting behaviours practiced by PIED users may underlie the comparatively low prevalence of BBVs among PIED users.

While there has been limited research concerning rates of BBVs among PIED users in Ireland, international studies have found the prevalence to be much lower than that typically found among those who inject psychoactive drugs. Table 6 provides a summary of international studies which have assessed BBV prevalence among PIED users. In Australia, studies which have employed serological testing have found no evidence of HIV (Aitken, et al., 2002; Day et al., 2008). Conversely, in a study which incorporated self-report measures, a rate of 12% HIV was found (Larance et al., 2008). Rates of HCV found in the aforementioned

Australian studies ranged from 5-10% and rates of HBV ranged from 3-12%.

A small number of studies have been conducted in the UK, with a recent study from Hope and colleagues (2013) finding seroprevalence rates of HIV (1.5%), HCV (5.5%), and HBV (8.8%). Such results suggested that although BBVs remained relatively low, it indicated an elevated prevalence of HIV and HBV compared to previous research (Crampin et al., 1998) in a UK context. It is however noteworthy that within these studies, the positive cases of BBVs found were often associated with factors such as a bisexual or homosexual orientation, incarceration, injecting psychoactive drug use, and number of tattoos. As such, it is difficult to ascertain whether contraction of BBVs was a consequence of injecting PIED use. A further complication in attempting to extrapolate BBV prevalence among PIED users may be that users are less likely to get screened (Day et al., 2008). Given the high prevalence of injecting PIED use, coupled with the risk factor for BBVs, the apparent lack of screening access/uptake, and the potential for injecting related injuries; the importance of harm reduction services engaging with PIED users has been emphasised across a number of studies (Hope et al., 2013; Larance et al., 2008).

TABLE 6*Overview of Studies of Blood-borne Virus Prevalence Among PIED Users*

Study	Location	Participants	Test Type	HIV	HCV	HBV	Factors Associated with Positive Status
Crampin et al., 1998	England and Wales	149 AAS injectors recruited through HIV Prevalence Monitoring Survey	Biological testing	0%	—	2%	—
Aitken, et al., 2002	Victoria, Australia	63 PIED injectors recruited from Steroid Peer Education Program	Biological testing	0%	9.5%	12%	HCV associated with heroin injection, imprisonment, sharing needles to inject other drugs, no. of tattoos, and HBV exposure. HBV associated with hepatitis C virus exposure, past imprisonment and age of first injection
Day et al., 2008	New South Wales, Australia	318 PIED injectors recruited from NSP Survey participants during the years 1995 –2004	Biological testing	0%	10%	N/A	HCV associated with homo/bisexual orientation and a history of tattooing.
Larance et al., 2008	New South Wales, Australia	60 PIED users recruited through advertisement	Self-report	12%	5%	3%	All HIV were bisexual or homosexual orientation. HBV positive self-reports were associated with HIV positive self-reports. HCV associated with having ever injected other illicit drugs and lifetime use of heroin.
Hope et al., 2013	England and Wales	395 PIED users recruited from across 19 NSPs	Biological testing	1.5%	5.5%	8.8%	HIV associated with having male sexual partners, having sought advice from STI clinic, having abscess/open wound at injection site. HCV associated with having ever injected psychoactive drug/having taken a phosphodiesterase type 5 inhibitor in the preceding year. HBV associated with having obtained advice from an SH/STI clinic and having not injected oneself subcutaneously in the preceding year.

1.3.5. The interaction of harm reduction and users of PIEDs.

Given the furtive nature of PIED use, users are reluctant to seek medical treatment and furthermore, they often lack trust in health care professionals (Chandler & McVeigh, 2014; Dunn, 2002; Pope, Kanayama, Ionescu-Pioggia, & Hudson, 2004). Thus, the main agencies which are likely to maintain regular contact with this group are NSPs (Larance et al., 2008). The evidence indicates that NSPs in many regions are providing services to PIED users (Day et al., 2008; McVeigh et al., 2003; Rich et al., 1999; Robinson et al., 2008). That being said, the relatively sudden influx of a client group whose characteristics, range of substance use, and injecting practices differ significantly from the traditional client base means that harm reduction service providers are faced with several challenges in attempting to respond to the corresponding shift in client needs. Such challenges are manifest in a recent study from Dunn and colleagues (2014), which explored the perspectives of staff working in NSPs with regard to providing services to steroid users. In particular, workers described the difficulty in acquiring specialised knowledge around the nature and effects of PIED use, associated injecting practices, and the provision of appropriate injecting equipment. Accordingly, a common recommendation proposed within the literature is for the provision of specialist training and education for NSP workers (Dunn, McKay, & Iversen, 2014; Iversen et al., 2013).

The wider recommendations emanating from studies concerning harm reduction and PIED users emphasise the need for further service development and support a targeted intervention for this group. In terms of the requirements of PIED users, research has advocated the need for education and harm reduction advice around BBV infections, vaccinations, injecting techniques, risk behaviours, dose and frequency of PIED use, adverse physical effects associated with PIED use, diet and training, use of other illicit

substances, sexual health, and the importance of monitoring physical and psychological health, as well as access to sterile injecting equipment, BBV testing, HBV vaccination, and sexual health services (Aitken et al., 2002; Hope et al., 2013; Iversen et al., 2013; Larance et al., 2008). However, in reality, there is a high level of variability in the delivery of harm reduction programmes for PIED users across services, which highlights the lack of best practice policy guidelines (Kimergård & McVeigh, 2014),

A number of additional concerns are evident in attempting to apply existing programmes of harm reduction as a method of intervention for PIED users. This group do not perceive themselves as

„drug users“, and therefore, the stigma associated with conventional drug services, such as NSPs, is likely to impede service uptake and reduce engagement amongst PIED users (Dunn et al., 2014; Kimergård & McVeigh, 2014; Simmonds & Coomber, 2009). The manner in which PIED users typically utilise services would appear to support this assertion, as although the majority of clients who attend NSPs obtain injecting equipment, few appear to use these services for seeking information (Larance et al., 2008). Further concerns, which have been discussed by service providers within the literature, include the extent of the boundaries around interventions for PIED users (e.g. whether or not to provide information on specific types of AAS), and indeed, whether harm reduction services should cater for PIED users at all as resourcing their needs shifts funding and focus away from the traditional client base (Dunn et al., 2014; Kimergård & McVeigh, 2014). In the effort to address the aforementioned concerns and enhance the interaction between PIED users and harm reduction, a small number of specialist, steroid-specific services, have been implemented in the United Kingdom and Australia. While such programmes appear to

show potential, there remains limited empirical evaluation of their effectiveness in minimising harm (Kimergård & McVeigh, 2014).

1.4. THE PRESENT STUDY

The literature has highlighted the growing incidence of users of PIEDs accessing harm reduction services, the diverse profile and harm reduction needs of this group, and the challenges faced by public health initiatives and service providers in responding to this emerging trend. Given the lack of previous research in an Irish context, there exists a need to develop an evidence base which explores the profile of PIED users and their perspectives on Irish harm reduction services, in order to inform interventions which aim to address the risk of harm within this group.

1.4.1. Research context. The present study is being conducted in conjunction with Merchants Quay Ireland (see www.mqi.ie), an Irish based organisation which offers a variety of services for individuals who are homeless and /or drug users. Within the spectrum of facilities offered, MQI Day Services provide frontline drug services. A cornerstone of the drug service is the Health Promotion Unit - Needle Exchange. The main objectives of the Health Promotion Unit are concerned with minimising the harms associated with drug use and educating drug users on the potential risks. Accordingly, the primary focus is on HIV and Hepatitis prevention, promoting safer injecting behaviours and techniques, providing information on associated risks and offering drug users a pathway in to treatment.

1.4.2. Research questions. The present study aims to examine the profile and perspectives of users of PIEDs accessing Irish based harm reduction services. Accordingly, the research is focused on the PIED using client base of services, with the specific research questions being:

- What is the socio-demographic profile?
- What are the motivations for PIED use and the history of use?
- What is the nature of PIED use and trends in PIEDs use?
- What are the side-effects experienced in association with use of PIEDs?
- What are the patterns of poly-substance use?
- What is the training and exercise profile?
- What are the injecting practices?
- What are the levels of testing for BBVs, prevalence of BBVs, and uptake of treatment for BBVs?
- What are PIED users perspectives on harm reduction services?

Chapter 2: Methodology

This chapter describes the specific methodology incorporated in the present study. An outline of the research design and the corresponding rationale is included, as well as information relating to the sampling and characteristics of the participants. In addition, the chapter provides a description of the materials used, the procedure of data collection, and the method of data analysis. In the concluding section, the ethical issues associated with the study, and the steps taken to address these, are also presented.

2.1. RESEARCH DESIGN

A mixed method research design was employed in the present study. A mixed method approach is focused on the collection, analysis, and mixing of both quantitative and qualitative data, with an underlying principle that the use of quantitative and qualitative approaches in concert facilitates a more in depth understanding of the research problem than the use of either approach exclusively (Creswell & Plano-Clark, 2011). Johnson and Onwuegbuzie (2004) assert that research approaches should be blended in a manner which affords the best opportunities for achieving important research objectives. Given that the present study aimed to examine the profile of PIED users accessing harm reduction services, while concurrently eliciting their perspectives on harm reduction service provision, a mixed method research paradigm was considered to be the optimal fit.

2.2. PARTICIPANTS AND SAMPLING

Purposive sampling (e.g. see, Teddlie & Tashakkori, 2009) was utilised for the present study in order to identify individuals attending harm reduction services, who were users of PIEDs. The sample was drawn from clients presenting to harm reduction services in Ireland. Staff at Merchants Quay Ireland (MQI) Day Services, which are primarily based in Dublin, were asked to identify attendees who were current PIED users and participants were recruited through the organisation. The sample consisted of 89

participants, all of whom were male. The age of participants ranged from 18-40 years ($M=26.91$, $Mdn=26$, $SD=5.87$). Eighteen participants were currently on their first cycle of PIEDs usage, and 71 participants had completed at least one cycle of PIEDs use.

2.3. MATERIALS

A mixed method questionnaire was developed for the purposes of data collection. Items included within the questionnaire were informed by the extant literature surrounding PIED use and injecting drug use (e.g., van Amsterdam et al., 2010, Brunson, 2010, Flemen, 2011, Hildebrandt, Langenbucher, Lai, Loeb, & Hollander, 2011, Jennings, 2013, Peters, Copeland, & Dillion, 1999). The questionnaire included nine sections which focused on: *socio-demographic characteristics* (age, gender, nationality, sexual orientation, ethnic background, county/type of residence, occupation, employment status, level of education), *use of PIEDs* (use of AAS, use of ancillary compounds and post-cycle substances, nature of use, history of use, motivation for use), *side-effects experienced in association with PIED use* (either during, post, or between cycles), *use of other substances* (substance use, history of use, route of administration), *training and exercise* (nature and intensity), *injecting practices* (method, site, related injuries, environment, risk behaviours), *blood-borne viruses* (testing, status, and treatment), *harm reduction service utilisation* (attendance, motivation) and *perspectives on harm reduction services* (experience of services, suggestions for service provision, general commentary).

2.4. PROCEDURE

A pilot study was conducted with two participants in order to examine elements involved in the research process. Following this pilot study, issues around the materials, procedure, and logistics were discussed and refined. Data collection for the main study took place over a period of 8 weeks. Clients

presenting to MQI harm reduction services, who were users of PIEDs, were invited to participate in the research study. Information sheets, which outlined the nature, purpose, and conditions of the study, were provided to all potential participants. Written consent was obtained from individuals who decided to take part in the study. Data collection was conducted within the needle exchange, safer injecting, and outreach departments of the health promotion unit in MQI Day Services. Participants were offered the questionnaire, prompted to read the instructions, and given the opportunity to ask questions. Participants then self-completed the instrument. The average time for completion for the questionnaire was approximately 15-20 minutes and all questionnaires were completed in the presence of a member of the research team. In any instances where participants had issues around literacy or language diversity, data administrators assisted them in filling out the questionnaire. In this scenario, data administrators were instructed to avoid asking participants leading questions or influencing responses.

2.5. DATA ANALYSIS

Analyses of quantitative data were primarily descriptive in nature, with appropriate statistical data analyses carried out using the Statistical Package for the Social Sciences (SPSS; V.20.). Prior to analysis, missing responses were identified and coded. The results presented herein are adjusted for these missing data. Qualitative data were analysed using the inductive thematic analysis framework described by Braun and Clark (2006): data were transcribed verbatim; coded in a systematic fashion and collated in to initial themes; themes were reviewed and checked in relation to the coded extracts; a formative inter-rater reliability check was conducted, with a consensus-percent of 76% reached; following discussion around problematic themes, a number of elements were refined; and finally themes were defined. In order to assess reliability of the findings, a

summative inter-rater reliability check was conducted, which showed an overall consensus level of approximately 92%. All qualitative data analyses were completed manually.

2.6. ETHICAL CONSIDERATIONS

A number of ethical issues presented within the current study. In order to address issues around informed consent; an information sheet was provided to all participants to ensure that they were fully aware of the nature of the study and the terms of participation. Within this information sheet, it was also emphasised that participation was completely voluntary, and non-participation would not negatively impact their relationship

with MQI in any way. Participants were also made aware that all information provided was confidential and would be used in a published research study. Written consent was obtained from all participants to document that they understood the conditions of the study and agreed to participate voluntarily. Additionally, participants were encouraged to ask questions at all stages during the research process. Due to the nature of the research and the content of the questionnaire, the data collection process included the potential for sensitive data to be elicited. In order to address issues around sensitivity, training around the collection of sensitive data was provided to all administrators, and aftercare protocols, such as the provision of on-site counselling and medical services, were implemented.

**WITHIN THIS INFORMATION SHEET, IT
WAS ALSO EMPHASISED THAT
PARTICIPATION WAS COMPLETELY
VOLUNTARY, AND NON-PARTICIPATION
WOULD NOT NEGATIVELY IMPACT THEIR
RELATIONSHIP WITH MQI IN ANY WAY.**

Chapter 3: Findings

The aim of the present study was to examine the profile and perspectives of individuals accessing harm reduction services who are users of PIEDs. Data collected consisted of participants self-reported responses on a mixed method questionnaire. Quantitative data included *socio-demographic characteristics, use of PIEDs, side-effects experienced in association with use of PIEDs, training and exercise, use of other substances, injecting practices, blood-borne viruses, and harm reduction service utilisation*. Qualitative data were comprised of participants *perspectives on harm reduction services*. Within this chapter, results gleaned from quantitative analyses are presented at the outset, and are then followed by a description of the qualitative findings.

3.1. DESCRIPTIVE STATISTICS

The descriptive statistics for the total sample are illustrated in Table 7. Eighty-nine participants took part in the study and all participants were male. Significantly, no female clients, who were users of PIED, presented to services during the period of data collection. The age of participants ranged from 18-40 years old, with the average age being approximately 27 years old (M=26.91, Mdn=26, SD=5.87). In further delineating the age profile; approximately 38% of participants were aged 18-24 years old, 30% were aged 25-29 years old, 17% were aged 30-34 years old, and 14% were aged 35-40 years old.

3.2. SOCIO-DEMOGRAPHIC CHARACTERISTICS

The socio-demographic characteristics examined within the questionnaire included nationality, ethnicity/cultural background, sexual orientation, current accommodation status, county and area of residence, level of education, employment status, and occupation. The results for each of these variables are presented in the tables below.

TABLE 7 *Descriptive Statistics for the Total Sample*

	Total Sample
Participants (N)	89
Range (age)	18-40
Mean (age)	26.91
Median (age)	26
Std. Deviation (age)	5.87

TABLE 8 *Nationality*

	n	%
Irish	80	89.9
Brazilian	3	3.4
Spanish	1	1.1
Latvian	1	1.1
British	1	1.1
Dutch	1	1.1
Iranian	1	1.1
Polish	1	1.1
Total	89	100

TABLE 9 *Ethnic/Cultural Background*

	n	%
White Irish	72	80.9
Any other (including mixed background)	7	7.9
White Irish Traveller	3	3.4
Any other white background	3	3.4
Black or black Irish – African Origin	1	1.1
Black or Black Irish - any other Black background	1	1.1
Asian or Asian Irish – Chinese origin	1	1.1
Asian or Asian Irish - any other Asian background	1	1.1
Total	89	100

As depicted in Table 8, the sample comprised 8 different nationalities, with a large majority of participants being *Irish* nationals.

Table 9 illustrates the ethnic/cultural background of the sample. While the majority of participants were *White Irish* (80.9%), there was a diverse mix of ethnicities among the sample.

Table 10 displays the sexual orientation of participants. Just over 90% of respondents reported a *heterosexual* orientation, whereas less than 10% reported a *homosexual* or *bisexual* orientation.

As illustrated in Table 11, the most common categories of accommodation status reported were *parental home* and *private rented accommodation*. *Other accommodation* types included council housing (n=3), partner's residence (n=2), and aunt/uncle's residence (n=2).

Table 12 highlights that the majority of respondents resided in *Dublin* (89.3%). Overall, less than 3% of respondents resided in counties outside of Leinster.

TABLE 10 *Sexual Orientation*

	n	%
Heterosexual	80	90.9
Homosexual	5	5.7
Bisexual	3	3.4
Total	88	100

*Missing Observations=1

TABLE 11 *Current Accommodation Status*

	n	%
Parental home	37	41.6
Private rented accommodation	34	38.2
Own home	7	7.9
Emergency accommodation	3	3.4
Staying with friends (non-tenant)	1	1.1
Other accommodation	7	7.9
Total	89	100

TABLE 12 *County of Residence*

	n	%
Dublin	75	89.3
Rest of Leinster	7	8.3
Outside of Leinster	2	2.4
Total	84	100

*Missing Observations=5

As illustrated in Table 13, participants, who were residing in Dublin, reported a wide range of areas of residence. Postcodes which were noted most prevalently included *Dublin 7* (14.7%) and *Dublin 8* (12%).

There was a varied level of education completed among respondents. Table 14 illustrates that the most common level of education completed was *lower secondary* (34.1%), followed by *higher secondary* (22.7%) and *third level non-degree* (20.5%).

TABLE 13 *Area of Residence of Dublin based Participants*

	n	%
D1	4	5.3
D2	1	1.3
D3	4	5.3
D4	1	1.3
D5	6	8
D6	1	1.3
D6W	1	1.3
D7	11	14.7
D8	9	12
D9	5	6.7
D11	6	8
D12	7	9.3
D13	4	5.3
D14	2	2.7
D15	1	1.3
D16	1	1.3
D17	4	5.3
D22	3	4
D24	1	1.3
County Dublin	3	4
Total	75	100

TABLE 14 *Highest Level of Education Completed*

	n	%
Third level degree or higher	11	12.4
Third level non-degree	18	20.5
Higher Secondary	20	22.7
Lower Secondary	30	34.1
Primary education	7	8
No formal education	2	2.3
Total	88	100

*Missing Observations= 1

As shown in Table 15, approximately two-fifths of participants reported currently being in some category of employment. However, almost half of participants reported currently being *unemployed*.

Respondents reported a broad assortment of occupations, which are displayed in Table 16.

Skilled trade was the most prevalently reported class of occupation with just under a third of respondents reporting vocations such as carpenter, electrician, plumber or mechanic. Occupations within the spectrum of the *health industry* (e.g. gym management, fitness instructor, nutritionist), were reported by just over 10% of respondents, as were occupations within the *retail/sales* industry, and the *security* industry. A large number of participants neglected/declined to state an occupation.

3.3. USE OF PIEDs

Within the use of PIEDs section of the questionnaire, participants were asked questions around motivation for PIED use, use of AAS, history of use, nature of use, and use of ancillary compounds and post-cycle substances. Results pertaining to PIED use are presented below.

TABLE 15 *Employment Status*

	n	%
Unemployed	45	48.9
Employed full-time	19	20.7
Employed part-time	10	10.9
Student	10	10.9
Self-employed	5	5.4
Employed on employment scheme	2	2.2
Other employment status	1	1.1

*3 participants reported being students and employed part time

TABLE 16 *Occupation*

	n	%
Skilled Trade	21	30.9
Health Industry	8	11.8
Retail/Sales	8	11.8
Security	7	10.3
Hospitality	6	8.8
Engineering/IT	4	5.9
Manual Labour	4	5.9
Logistics/Driver	3	4.4
Public Service	2	2.9
Student	2	2.9
Modeling	2	2.9
Social Care	1	1.5
Total	68	100

*Missing Observations=21

Table 17 highlights motivations for PIED use. Among the most prevalently reported motivations were *to increase muscle mass* (91%), *to increase strength* (75.3%), *to look good* (62.9%) and *to increase confidence* (51.7%).

Table 18 outlines the descriptive statistics relating to use of oral AAS and injected AAS. Sixty-one participants reported use of oral AAS, with the age of first use ranging from 15-36 years old (M=22.71, SD=4.64). Eighty-six participants reported injecting use of AAS, with the age of first use ranging from 16-39 years old (M=23.84, SD=5.04).

Table 19 illustrates the sequence of AAS use reported. Approximately 37% of respondents started *using oral steroids and then progressed to injecting steroids*, 18% *started using steroids orally and injecting steroids at the same time*, and 11% *started injecting steroids and then later used steroids orally*.

TABLE 17 Motivation for PIED Use

	n	%
Increase muscle mass	81	91
Increase strength	67	75.3
To look good	56	62.9
Increase confidence	46	51.7
Dissatisfied with body shape	43	48.3
Recreational weightlifting	36	40.4
Bodybuilding	38	42.7
Decrease fat	33	37.1
Increase endurance	33	37.1
Occupational reasons	14	15.7
Rehabilitate injury	13	14.6
Sport	12	13.5
Prevent injury	9	10.1

TABLE 18 Descriptive Statistics for AAS Use

	Oral	Injected
Participants (n)	61	86
Mean (age of first use)	22.77	23.84
Median (age of first use)	22	22
Std. Dev. (age of first use)	4.64	5.04
Range (age of first use)	15-36	16-39

TABLE 19 Sequence of AAS Use

	n	%
Started oral steroids and then later injected steroids	33	37
Only ever injected steroids	27	30.3
Started oral and injected steroids at the same time	16	18
Started injecting and then later oral	10	11.2
Only ever used oral steroids	3	3.4
Total	89	100

Table 20 illustrates the types of AAS which participants reported using during their current cycle and during their previous cycles. While respondents reported current and past use of a wide variety of AAS, *Testosterone* (single/multi esters) was by far the most prevalently used AAS during current cycle (84%) and previous cycles (77.5%). Other AAS which were commonly being used during current cycles included *Nandrolone decanoate* (31.3%) and *Trenbolone acetate* (19.3%). Although other AAS such as *Oxandrolone*, *Drostanolone*, *Methandrostenolone*, *Boldenone*, and *Oxymetholone* appeared to have been frequently used during previous cycles, respondents reported little use of these substances during their current cycles.

There was a wide spread in terms of the number of cycles of PIED use respondents had undertaken over their lifetime. As displayed in Table 21, just under half of respondents were on either their *first cycle* or *second cycle* of PIED use. Almost a fifth of respondents were currently on their *sixth* or *higher cycle* (18%).

TABLE 20 *Types of AAS used During Current Cycle and Previous Cycles*

	Current Cycle (%)	Previous Cycles (%)
Testosterone (single/multi esters)	84.3	77.5
Nandrolone Decanoate	31.3	53.5
Trenbolone Acetate	19.3	35.2
Stanozolol	10.8	22.5
Oxandrolone	7.2	33.8
Drostanolone	7.2	22.5
Methandrostenolone	6	49.3
Boldenone	4.8	19.7
Oxymetholone	3.6	22.5
Trenbolone hexahydrobenzylcarbonate	2.4	8.5
Mesterolone	1.2	8.5
Methenolone	1.2	14.1
Chlorodehydromethyltestosterone	0	14.1
Nandrolone Undecanoate	0	7
Fluoxymesterone	0	2.8
Formebolone	0	1.4

TABLE 21 *Number of Current Cycle*

	n	%
First cycle	18	21.4
Second cycle	20	23.8
Third cycle	12	14.3
Fourth Cycle	12	14.3
Fifth Cycle	7	8.3
Sixth or Higher Cycle	15	18
Total	84	100

*Missing Observations=5

Table 22 shows that there was a wide variance in the length of participants' usual cycles. While the most commonly reported length of usual cycle was 6-8 weeks, some participants cycled for less than 5 weeks whereas, others cycled PIEDs for a period lasting more than 17 weeks.

Table 23 details where participants sourced their AAS and highlights that almost two-fifths of participants sourced their AAS from friends (38.6%). Other sources which featured prominently included through direct contact with a supplier (25%), through a supplier in gym (20.5%), and through the internet (17%).

Table 24 depicts use of ancillary compounds and post cycle treatment drugs used during current cycle and during previous cycles. Just over half of participants reported that they engaged in post cycle therapy (n=48; 53.9%), whereas just under half reported that they did not (n=41; 46.1%). Again, participants reported use of a wide variety of substances. The substances being used most prevalently during current cycles included Creatine (23.9%) and Aromatase Inhibitors/Anti-Oestrogens (10.1%).

Substances which were most commonly used during previous cycles included Creatine (37.5%), HCG (27.2%), Clenbuterol (25.8%), Aromatase Inhibitors/Anti-Oestrogens (24.7%), and Clomiphene citrate (21.3%).

TABLE 22 Length of Usual Cycle

	n	%
Less than 5 weeks	16	18
6-8 weeks	26	29.2
9-11 weeks	17	19.1
12-14 weeks	14	15.7
15-17 weeks	7	7.9
More than 17 weeks	9	10.1
Total	89	100

TABLE 23 Acquisition of PIEDs

	n	%
Friends	34	38.6
Direct contact with supplier	22	25
Supplier in gym	18	20.5
Internet	15	17
Direct contact with laboratory	2	2.3
Family	2	2.3
Tanning Salon	1	1.1
Other Source	4	4.5

*Missing Observations=1

TABLE 24 Use of Ancillary Compounds/Post Cycle Treatment Drugs

	Current Cycle (%)	Previous Cycles (%)
Creatine	23.9	37.5
Aromatase Inhibitors/Anti-Oestrogens	10.1	24.7
Human Chorionic Gonadotrophin (HCG)	8	27.2
Human Growth Hormone (HGH)	6.7	7.9
Clomiphene citrate	5.6	21.3
Testosterone Boosters	4.5	9.1
Clenbuterol	3.4	25.8
Ephedrine	2.2	18
Thyroid Agents	2.2	11.2
Tanning Agents	1.1	7.9
Growth hormone releasing hexapeptide/hormone	1.1	3.4
Insulin	1.1	2.2
Diuretics	1.1	2.2
Growth Hormone Fragment	1.1	1.1
Insulin Growth Factor (IGF)	1.1	0
Pro-hormones (PH)	0	5.6
Anti-acne medication	0	3.4
Gammahydroxybutyrate (GHB /GBL)	0	1.1

3.4. SIDE EFFECTS EXPERIENCED IN ASSOCIATION WITH USE OF PIEDs

Participants were asked to detail the side-effects which they had experienced (either during, post, or off cycle) in association with their use of PIEDs. A broad range of side-effects were noted with Table 25 highlighting the most prevalent side-effects experienced currently and previously.

3.5. TRAINING AND EXERCISE

Within this section of the questionnaire, participants were asked questions around participation in training and exercise, which included type of exercise, frequency of exercise, and participation in organised sport. Results relating to the training and exercise are presented below.

Almost all participants reported that they participated in a regular training and exercise programme (n=87; 97.8%). The number of days participants participated in training and exercise is illustrated in Table 26, which shows that just under half of participants reported that they exercised *more than 5 days a week* (46.1%).

In terms of type of training and exercise, 91% of participants reported participation in weight training (n=81) and approximately 80% of participants reported participation in cardiovascular exercise (n=71). The number of sessions respondents participated in weight training and cardiovascular exercise is presented in Table 27. The most frequently cited number of weight training sessions per week was *5-7* (n=46) and the most common number of cardiovascular exercise sessions per week was *2-4* (n=49).

TABLE 25 *Most Prevalent Side-Effects Experienced in Association with use of PIEDs*

	Currently (%)	Previously (%)
Increased sex drive	42.7	46
Increased appetite	41.6	49.4
Testicular atrophy	26	29.2
Increased aggression	23.6	38.2
Growth of excessive body hair	23.6	36
Sudden mood changes	22.5	31.5
Water retention	20.2	45
Acne	16.9	36
Anxiety	13.5	19.1
Insomnia	10.1	23.6
Muscle/Joint pain	10.1	22.5
Decreased sex drive	9	33.7
Depression	9	18

TABLE 26 *Number of Days Exercised per Week*

	n	%
None	2	2.2
Once a week	1	1.1
2-3 days a week	10	11.2
4-5 days a week	35	39.3
More than 5 days a week	41	46.1
Total	89	100

TABLE 27 *Frequency of Participation in Weight Training and Cardiovascular Exercise*

	Weight Training (%)	Cardiovascular Exercise (%)
None	9	20.2
One session a week	1.1	14.6
2-4 sessions a week	36	55.1
5-7 sessions a week	51.7	9
8-10 sessions a week	2.2	1.1
Total	100	100

Approximately 46% of respondents (n=41) reported participation in organised sport, with some participants engaging in more than one category of sport. All of the participants engagement in sport was at an amateur/recreational level, with the exception of 1 participant, who competed professionally. Table 28 illustrates the types of sport played and indicates that the most prevalently reported types included *bodybuilding* (15.7%), *boxing* (10.1%), and *soccer* (10.1%).

3.6. USE OF OTHER SUBSTANCES

Within the questionnaire, participants were asked whether they had ever used other substances, if used, what was the route of administration, and which substances they had used in the past month. The results emanating from participants responses are described below.

Table 29 shows that participants reported use of an assortment of other substances. Substances such as *Alcohol* (95.5%), *Tobacco* (71.6%), *Cannabis* (68.2%), *Cocaine* (56.8%), and *Benzodiazepines* (35.8%) showed particularly high levels of lifetime use. Recent use (defined as use during the past month) of the aforementioned substances was also relatively prevalent. It is also noteworthy that participants reported injecting use of *Heroin* (11.4%), *Cocaine* (5.7%), and *New psychoactive substances* (2.3%).

3.7. INJECTING PRACTICES

Within the questionnaire, participants were asked questions around where they learnt to inject, method of injecting, injecting site, injecting related injuries, physical injecting environment social injecting environment, administration of injection, and injecting risk behaviours. Results pertaining to these injecting practices are presented below.

As detailed in Table 30, the majority of respondents (55%) reported learning to inject from *other PIED users*. Just over 30% of participants learnt to inject through a *harm reduction service* or *medical professional*.

TABLE 28 *Type of Organised Sport*

	n	%
No participation in organised sport	48	53.9
Bodybuilding	14	15.7
Boxing	9	10.1
Soccer	9	10.1
Mixed martial arts	7	7.9
Kickboxing	4	4.5
Rugby	4	4.5
Swimming	4	4.5
Other sport	4	4.5

TABLE 29 *Other Substances Ever Used, Ever Injected, and Recently Used*

	Lifetime Use (%)	Ever Injected (%)	Recent Use (%)
Alcohol	95.5	0	62.5
Tobacco	71.6	0	52.3
Cannabis	68.2	0	39.8
Cocaine	56.8	5.7	17
Benzodiazepines	35.2	0	22.7
Ecstasy	23.9	0	3.4
Anti-depressants	19.3	0	8
New psychoactive substances	17	2.3	1.1
Methadone	13.6	0	9.1
Crack	11.4	0	1.1
Heroin	12.5	11.4	3.4
Methamphetamine	9.1	0	1.1

TABLE 30 *Learning to Inject*

	n	%
Other PIED users	44	55
Internet	20	25
Harm reduction service	19	23.8
Drug supplier	13	16.3
Medical Professional	7	8.8
Self-taught	4	5
Family/Friends	2	2.5

*Missing Observations=9

Table 31 illustrates the method of injection used currently and previously. While *intramuscular injection* was the most popular method of injection among respondents, *subcutaneous* and *intravenous injection* was also reported, with some respondents using multiple methods. All participants who reported intravenous injection also reported current/previous injecting use of heroin.

Table 32 displays the injecting site used currently and previously by respondents. Injection in to the *Buttocks* was by far the most prevalently used site both currently and in the past, with *Deltoids* and *Quadriceps* being the next most frequently used injecting sites.

A number of respondents had experienced injecting related injuries. As shown in Table 33, *Muscle pain* (47.5%) and *Bruising* (37.5%) were the most commonly experienced injuries.

Table 34 illustrates the physical environment, in which, respondents reported injecting. Four-fifths of respondents reported that they *always injected at home*, whereas 2% reported that they *always injected at the gym*.

TABLE 31 *Method of Injection Used*

	Currently (%)	Previously (%)
Intramuscular	93.6	94.4
Subcutaneous	14.1	19.7
Intravenous	1.3	11.3

*Missing Observations=11 *Missing Observations=18

TABLE 32 *Injecting Site*

	Currently (%)	Previously (%)
Buttocks	91	90.1
Deltoids	25.6	36.6
Quadriceps	20.5	22.5
Triceps	3.8	8.5
Biceps	2.6	4.2
Chest	1.3	2.8
Calves	1.3	1.4
Lower Back	0	2.8

*Missing Observations=11 *Missing Observations=18

TABLE 33 *Injecting Related Injuries*

	n	%
Muscle pain	38	47.5
Bruising	30	37.5
Abscesses	14	17.5
Scarring	6	7.5
Infections	4	5
Nerve damage	2	2.5

*Missing Observations=9

TABLE 34 *Physical Injecting Environment*

	Home (%)	Gym (%)	Other (%)
Always	80	2	2
Sometimes	16	14	8
Never	4	84	90

*Missing Observations=9

Table 35 depicts the social environment, in which, the respondents reported injecting. Over half of the respondents *always injected alone*, whereas a quarter *always injected with others*. Approximately two-fifths of respondents *sometimes injected with others*.

Table 36 shows that 71% of respondents *always injected themselves* and 16% were *always injected by another person*. Approximately 13% *sometimes injected themselves* and *sometimes were injected by another person*.

Table 37 illustrates respondents level of reuse of injecting equipment and indicates that while the vast majority *never reused their injecting equipment*, there were respondents who *sometimes reused*, and *always reused*.

As displayed in Table 38, there were few reports of respondents lending their used injecting equipment to other parties, with the bulk of respondents stating that they *never lent used needles, syringes, or other injecting equipment to others*.

Table 39 illustrates rates of borrowing injecting equipment and suggests very low levels, with 98% of respondents reporting that they *never borrowed used needles, syringes, or other injecting equipment from other people*.

TABLE 35 *Social Injecting Environment*

	Inject Alone (%)	Inject with Others (%)
Always	56	25
Sometimes	19	19
Never	25	56

*Missing Observations=9

TABLE 36 *Administration of Injection*

	Yourself (%)	Another Person (%)
Always	71	16
Sometimes	13	13
Never	16	71

*Missing Observations=9

TABLE 37 *Reuse of Injecting Equipment*

	Needles/Syringe (%)	Other Equipment (%)
Always	2	3
Sometimes	14	11
Never	84	86

*Missing Observations=9

TABLE 38 *Lending of Injecting Equipment*

	Needles/Syringe (%)	Other Equipment (%)
Always	0	0
Sometimes	5	5
Never	95	95

*Missing Observations=10

TABLE 39 *Borrowing of Injecting Equipment*

	Needles/Syringe (%)	Other Equipment (%)
Always	0	0
Sometimes	2	2
Never	98	98

*Missing Observations=9

3.8. BLOOD-BORNE VIRUSES

Within the questionnaire, participants were asked whether they had been tested for HIV, Hepatitis C, and Hepatitis B, when they were last tested, the results of testing, and whether they were receiving treatment in the case of positive cases. The results emanating from participants responses are described below.

Table 40 shows the data relating to testing for HIV. Approximately 48% of respondents had ever been tested for HIV. However, an equivalent amount had never been tested.

In terms of length of time since last HIV testing, Table 41 displays that while almost half of respondents had never been tested; just over 30% had been tested within the past year.

Table 42 illustrates that of those respondents who had ever been tested for HIV, there were no reports of a positive status.

Table 43 presents the data regarding participants testing for Hepatitis C. Approximately 48% of respondents had been tested for Hepatitis C, whereas a slightly higher proportion (49%) had never been tested.

TABLE 40 *HIV Testing*

	n	%
Tested	42	47.7
Never tested	42	47.7
Not known if tested	4	4.5
Total	88	100

*Missing Observations=1

TABLE 41 *Length of Time Since Last HIV Testing*

	n	%
Never tested	42	47.7
Less than 6 months	12	13.6
6-12 months	17	19.3
1-2 years	8	9.1
More than 2 years	5	5.7
Unknown	4	4.5
Total	88	100

*Missing Observations=1

TABLE 42 *HIV Test Results*

	n	%
Never tested	42	48.3
Negative	39	44.8
Positive	0	0
Unknown	6	6.9
Total	87	100

*Missing Observations=2

TABLE 43 *Hepatitis C Testing*

	n	%
Tested	42	47.7
Never tested	43	48.9
Not known if tested	3	3.4
Total	88	100

*Missing Observations=1

Table 44 depicts the length of time since last Hepatitis C testing and illustrates that while almost half of respondents had never been tested, approximately a third had been tested within the past year.

Table 45 presents the Hepatitis C test results of participants. Overall, 4.6% of respondents reported a positive status. When framed in terms of participants who had been tested and knew their result; positive statuses represented approximately 10% of these respondents. All participants who reported being positive for Hepatitis C had a past history of injecting drug use (all four had previously injected heroin, one had also previously injected cocaine and new psychoactive substances).

Table 46 shows the treatment status of participants who had tested positive for Hepatitis C and indicates that one participant had completed treatment, whereas other participants were either awaiting treatment (n=1), awaiting further tests (n=1), or had declined treatment (n=1).

Table 47 shows the data relating to testing for Hepatitis B. Approximately 48% of respondents had ever been tested for Hepatitis B. However, an equivalent amount had never been tested.

TABLE 44 *Length of Time Since Last Hepatitis C Testing*

	n	%
Never tested	43	48.9
Less than 6 months	13	14.8
6-12 months	16	18.2
1-2 years	9	10.2
More than 2 years	4	4.5
Unknown	3	3.4
Total	88	100

*Missing Observations=1

TABLE 45 *Hepatitis C Test Results*

	n	%
Not tested	43	49.4
Negative	36	41.4
Positive	4	4.6
Unknown	4	4.6
Total	87	100

*Missing Observations=2

TABLE 46 *Treatment Status for Hepatitis C*

	n	%
Completed treatment	1	25
Awaiting treatment	1	25
Awaiting further tests	1	25
Declined treatment	1	25
Total	4	100

TABLE 47 *Hepatitis B Testing*

	n	%
Tested	42	47.7
Not tested	42	47.7
Not known if tested	4	4.5
Total	88	100

*Missing Observations=1

Table 48 displays that while almost half of respondents had never been tested for Hepatitis B; over 30% had been tested within the past year.

Table 49 illustrates that of those respondents who had ever been tested for Hepatitis B, there were no reports of a positive status.

Table 50 illustrates that approximately 34% of respondents had been vaccinated for Hepatitis B, whereas 62% of respondents had not been vaccinated.

3.9. HARM REDUCTION SERVICE UTILISATION

Approximately three-fifths of respondents had previously attended a harm reduction service (n=52; 59.8%), whereas two-fifths were attending for the first time (n=35; 40.2%). As illustrated in Table 51, respondents primary motivations for attending services included to *obtain injecting equipment* (98.8%) and for *safer injecting advice* (67.1%).

3.10. PERSPECTIVES ON HARM REDUCTION SERVICES

A further aim of the present study was to explore participants perspectives around their experience and interaction with harm reduction services. Accordingly, qualitative data were collected which consisted of participant responses on three open-ended questions; “*what has your experience been like so far interacting with harm reduction and needle exchange services*”; “*have you any suggestions for services you would like to see offered to you in the future*”; and “*are there any other comments you would like to make*”. A large majority of the sample (n=85, 95%) provided responses to these questions. Data were analysed using inductive thematic analysis, which was conducted in line with the framework outlined by Braun and Clark (2006).

TABLE 48 Length of Time Since Last Hepatitis B Testing

	n	%
Never tested	42	47.7
Less than 6 months	13	14.8
6-12 months	16	18.2
1-2 years	9	10.1
More than 2 years	4	4.5
Unknown	4	4.5
Total	88	100

*Missing Observations=1

TABLE 49 Hepatitis B Test Results

	n	%
Never tested	42	50
Positive	0	0
Negative	40	47.6
Unknown	2	2.4
Total	84	100

TABLE 50 Vaccinated for Hepatitis B

	n	%
Yes	30	34.5
No	54	62.1
Unknown	3	3.4
Total	87	100

*Missing Observations=2

TABLE 51 Motivation for Attending Harm Reduction Services

	n	%
Obtain injecting equipment	84	98.8
Safer injecting advice	57	67.1
Obtain condoms	7	8.2
Medical service	6	7.1
Total	87	100

*Missing Observations=4

In total four prominent themes emerged during the course of analysis. Two of these themes related to participants' experiences of harm reduction services and are illustrated in Table 52. Participants' interactions with harm reduction and needle exchange services were generally described in terms of being a **positive and useful experience**. Within this theme, respondents expressed that their experience had been "positive" and outlined that they had found services useful for "information", "getting sterile injecting equipment", as well as learning about safer injecting practices. One respondent also referenced that he found the non-judgmental position of harm reduction services helpful, stating that "workers do not judge you". While a majority of respondents expressed positive sentiments towards services, a number detailed that there was also a negative aspect to their experiences. In particular, individuals who used PIEDs indicated that the presence of users of other substances within harm reduction services and needle exchanges created an **intimidating atmosphere**, which was described as being "uncomfortable", "nerve wracking" and "off-putting".

The additional two themes which emerged were related to participants' perspectives on future service provision and are presented in Table 53. Respondents proposed a range of **improvements to existing service provision**. Within this theme, the most prominently emphasised suggestions were for "increased medical services" and "more information on steroids". Additional propositions for service enhancement, which were less prevalently articulated, included the provision for more injecting equipment to be supplied within the needle exchange, "more needle variety", "information available in other languages" and a supervised "injecting room". Respondents also described that there should be more advertisement of the service in order to enhance awareness among the general community of PIED users.

TABLE 52 Overview of Themes Relating to Experiences of Harm Reduction Services

Theme	Sample Quotes	Frequency
Positive and useful experience	"Very useful service – got learned a thing or two" "found out new information and I found out the correct way to inject"	75
Intimidating atmosphere	"uncomfortable in service with other substance users" "General environment is difficult and would stop people coming"	11

TABLE 53 Overview of Themes Relating to Perspectives on Future Service Provision

Theme	Sample Quotes	Frequency
Improvements to existing service provision	"Improved medical service and improved information" "Opening hours in the evening"	38
Desire for a PIED specific service	"Having a specific steroid service" "separate steroid users from other substance users"	17

The final theme which emerged was centered on respondents' **desire for a PIED specific service**. As illustrated in Table 53, service users remarked that they would like a steroid specific service, which was

specialised to cater for their particular needs and medical issues. For some, this was allied with the desire for a facility, which operated a separate service for users of PIEDs.

RESPONDENTS ALSO DESCRIBED THAT THERE SHOULD BE MORE ADVERTISEMENT OF THE SERVICE IN ORDER TO ENHANCE AWARENESS AMONG THE GENERAL COMMUNITY OF PIED USERS.

Chapter 4: Discussion

The concluding chapter of this study will recount and summarise the principal aspects of the present research, and provide an integrative assessment of the findings. Accordingly, the aims and research questions are presented, and the main findings are outlined. Following this overview, findings are interpreted in the context of previous research and evaluated in terms of their implications. The elements of design and methodology are appraised from a critical perspective and suggestions for future research are proposed.

4.1. RESTATEMENT OF AIMS AND RESEARCH QUESTIONS

The objective of the present study was to examine the profile and perspectives of individuals attending harm reduction services who are users of PIEDs. Specifically, the study aimed to address nine primary questions:

- What is the socio-demographic profile?
- What are the motivations for PIED use and history of use?
- What is the nature of PIED use and trends in PIEDs use?
- What are the side-effects experienced in association with use of PIEDs?
- What are the patterns of poly-substance use?
- What is the training and exercise profile?
- What are the injecting practices?
- What are the levels of testing for BBVs, prevalence of BBVs, and uptake of treatment for BBVs?
- What are PIED users' perspectives on harm reduction services?

4.2. OVERVIEW OF KEY FINDINGS

Within this section, the key findings are described in accordance with the research questions posed within the current study.

What is the socio-demographic profile?

The average PIED user in the present study was approximately 27 years of age, although the age of participants ranged from 18 to 40 years old. All participants were male and significantly, no female PIED users presented during the period of data collection. While the sample was comprised of eight different nationalities, the vast majority were Irish nationals (90%). The dominant ethnic/cultural background was White Irish (80.9%), with few participants reporting Black or Asian backgrounds. Most of the participants reported a heterosexual sexual orientation (90.9%). The most common categories of current accommodation status reported were parental home (41.6%) and private rented accommodation (38.2%), with almost 85% of participants residing in Dublin. There was a varied level of education completed among respondents with the most widespread levels of education completed being lower secondary (34.1%), higher secondary (22.7%) and third level non-degree (20.5%). Almost half of the participants (48.9%) were currently unemployed and just under a fifth (20.7%) were in full-time employment.

What are the motivations for PIED use and the history of use?

Among the most prevalent motivations for PIED use were to increase muscle mass (91%), to increase strength (75.3%), to look good (62.9%), and to increase confidence (51.7%). Almost all participants (96.6%) reported lifetime injecting use of AAS, with the average age of initiation being approximately 24 years old. The youngest onset of injecting use was sixteen years old and the oldest was thirty-nine years. Approximately 69% of participants reported lifetime use of oral AAS. The average age of initiation was approximately 23 years old, with the age of first use ranging from fifteen to thirty-six years. In terms of the sequence of AAS use; approximately 38% of respondents started using oral steroids and

then progressed to injecting steroids, 18% started using steroids orally and injecting steroids at the same time, and 11.5% started injecting steroids and then later used steroids orally.

What is the nature of PIED use and trends in use?

There was a wide spread in terms of the number of cycles of PIED use respondents had undertaken over their lifetime. Just under half of respondents were on either their first cycle or second cycle of PIED use. Almost a fifth of respondents had completed five or more cycles (18%).

The most commonly reported length of usual cycle was 6-8 weeks (29.2%). However in just over 10% of cases, the length of usual cycle was more than seventeen weeks. In terms of the AAS being used; while respondents reported current and past use of a wide variety of AAS, Testosterone (single/multi esters) was by far the most prevalently used AAS during current cycle (84%) and previous cycles (77.5%).

Other AAS used previously/currently included Nandrolone decanoate and Trenbolone acetate. Although other AAS such as Oxandrolone, Drostanolone, Methandrostenolone, Boldenone, and Oxymetholone appeared to have been frequently used during previous cycles, respondents reported little use of these substances during their current cycles.

In terms of the use of ancillary compounds and post cycle treatment drugs; the substances being used most prevalently during current cycles included Creatine (23.9%) and Aromatase Inhibitors/Anti-Oestrogens (10.1%). Substances which were most commonly used during previous cycles included Creatine (37.5%), HCG (27.2%), Clenbuterol (25.8%), Aromatase Inhibitors/Anti-Oestrogens (24.7%), and Clomiphene citrate (21.3%).

What are the side-effects experienced in association with the use of PIEDs?

Participants described experiencing a broad range of side-effects in association with their use of PIEDs. Prominent side-effects which had been previously experienced included increased appetite (49.4%), increased sex drive (46%), water retention (44.1%), increased aggression (38.2%), growth of excessive body hair (36%), acne (36%), sudden mood changes (31.5%), testicular shrinkage (29.2%), decreased sex drive (33.7%), insomnia (23.6%), muscle/joint pain (22.5%), anxiety (19.1%), and depression (18%). Although cited with less frequency, participants reported currently experiencing a range of side-effects similar to those above.

What are the patterns of poly-substance use?

Participants reported the use a wide variety of substances within their lifetime, with alcohol (95.5%), tobacco (71.6%), cannabis (68.2%), cocaine (56.8%), and benzodiazepines (35.8%) showing the highest levels of lifetime use. It is also noteworthy that a small number of participants reported having ever injected heroin (11.4%), cocaine (5.7%), and new psychoactive substances (2.3%). Recent use (within the past month) of other substances was also frequently reported. Again, alcohol (62.5%), tobacco (52.3%), cannabis (39.8%), benzodiazepines (22.7%), and cocaine (17%) were the substances with the most prevalent recent use.

What is the training and exercise profile?

Almost all participants reported that they were engaged in a regular training and exercise programme, with over 85% stating that exercised four or more days a week. In terms of type of training and exercise, 91% of participants reported participation in weight training and approximately 80% of participants reported participation in

cardiovascular exercise. The most frequently cited number of weight training sessions per week was 5-7 and the most common number of cardiovascular exercise sessions per week was 2-4. Approximately 46% of participants reported current participation in organised sport, with some participants engaging in more than one category of sport. All of the participants' engagement in sport was at an amateur/recreational level, with the exception of 1 participant, who competed professionally. The most prevalently reported categories of organised sport included bodybuilding (15.7%), boxing (10.1%), and soccer (10.1%).

What are the injecting practices?

The majority of respondents (55%) had learned to inject from other PIED users, while just over 30% of participants had learned to inject through a harm reduction service or medical professional. While intramuscular injection was the most popular method of injection among respondents, subcutaneous and intravenous injection was also reported, with some respondents using a combination of methods. Injection in to the buttocks was by far the most prevalently used site, with deltoids and quadriceps being the next most frequently used injecting sites. Respondents had experienced a range of injecting related injuries, with muscle pain (47.5%) and bruising (37.5%) among the most commonly experienced injuries. In terms of the physical environment of injection; four-fifths of respondents reported that they always injected at home, whereas 2% reported that they always injected at the gym. In terms of the social environment of injection; over half of the respondents always injected alone, whereas 25% always injected with others. In terms of the administration of injection; 71% of respondents were always injected by another person and 16% always injected themselves. The majority of respondents stated that they had never reused (84%), lent (95%), or borrowed (98%) previously used needle or syringes.

What are the levels of testing for BBVs, prevalence of BBVs, and uptake of treatment for BBVs?

While approximately a third of participants had last been tested for HIV in the past 12 months, just under half of respondents had never been tested. Of those respondents who had ever been tested for HIV, there were no reports of a positive status. Similar results emerged concerning testing for Hepatitis C, which again illustrated that while almost half of respondents had never been tested, approximately a third had been tested within the past year. However, there were reports of positive cases, with 4.6% of respondents indicating that they had tested positive for Hepatitis C. When framed in terms of participants who had been tested and knew their result; positive statuses represented approximately 10% of these respondents. Significantly, all participants who reported being positive for Hepatitis C had a past history of injecting psychoactive drug use. Results pertaining to the treatment status of participants who had tested positive for Hepatitis C indicated that they had either completed treatment, were awaiting treatment or further tests, or had declined treatment. Just under half of participants had ever been tested for Hepatitis B, with approximately a third having last been tested within 12 months. There were no reports of a positive status for Hepatitis B and just over a third of respondents had been vaccinated against the virus.

What are PIED users' perspectives on harm reduction services?

Overall, participants described their interaction with harm reduction services in positive terms and articulated that services were particularly useful for accessing sterile injecting equipment and information relating to PIED use. That being said, service users also stated that the presence of users of other psychoactive substances within harm reduction services and needle exchanges created an intimidating atmosphere, which made them feel uncomfortable. In terms of

service provision, the primary desire expressed by respondents was for a separate, specialised service which catered for their medical needs and was dedicated exclusively to PIED use. Other suggestions for service provision included having more information on steroids, information available in other languages, more advertisement of the service, longer opening hours, and a supervised injecting room.

4.3. INTERPRETATION OF FINDINGS

Interpretation of the age and gender profile of the sample indicates congruence with previous research (see Table 1), in that, the majority of participants were males in their twenties. This accumulation of evidence may suggest that this demographic range is representative of the core group of adult PIED users. While a proportion of the wider socio-demographic characteristics of participants were perhaps reflective of the context in which the research was engaged (i.e. individuals who are White Irish, residing in close proximity to the target service), the range in nationality, cultural background, sexual orientation, level of education, and occupation evident in the findings, supports the notion that users of PIEDs attending harm reduction services represent an increasingly diverse group of individuals. Given that stigma, discrimination, and other barriers may impede groups such as females, members of the travelling community, foreign nationals, and sexual minorities in accessing and connecting with drug and health services (Gibbons, Manandhar, Gleeson, & Mullan, 2014; HSE, 2007; Lawless, 2003), the issues of cultural competence, inclusiveness, and accessibility would appear to be pertinent subjects for those services engaging with users of PIEDs.

The profile of individuals, who use PIEDs for non-medical purposes, was once associated with elite athletes but now encompasses a more wide-ranging population of users (Bahrke & Yesalis, 2004). The cohort of PIED users sampled in the present study appears to be consistent with the results

from international studies (e.g. Aitken et al., 2002; Cohen, et al., 2007) which have demonstrated that a high proportion of users of PIEDs are recreational and non-elite athletes, whose primary motivations for using such substances revolve around increasing muscle mass, enhancing physical strength and improving physical appearance. Although respondents reported being heavily engaged in training, exercise, and organised sport, participation in sport did not appear to be a significant motivation associated with use of PIEDs, whereas involvement in recreational weightlifting and bodybuilding did seem to be high motivators.

In terms of the trajectory PIED use, the results concerning age of initiation also show similarity to the previous evidence (e.g. Cohen et al., 2007; Larance et al., 2008; Peters et al., 1999), which has proposed that the onset of PIED use typically occurs around the mid-twenties. Almost all participants had used injectable AAS, with the popularity of injectable AAS over oral compounds also being the dominant trend within the wider literature. From a harm reduction perspective this presents a dilemma as although intramuscular injection of AAS may reduce the likelihood of liver damage (when compared to use of oral AAS), injecting use presents the risk of related injuries and BBV infections (Cohen et al., 2007). As such, the use of oral or injectable forms presents the risk of harm and highlights the difficulty in attempting to formulate harm reduction strategies relating to the use of specific PIEDs, and accentuates the challenges services face in setting the boundaries of harm reduction advice. With regard to the nature of PIED use, the findings imply that varieties of single/multi ester testosterone were the most prevalently used AAS, which complements the results from previous research (Cohen et al., 2007). That being said, the vast range of AAS and ancillary compounds being used by this group serves to further convolute the development of harm reduction programmes, and the training of harm reduction professionals.

The broad range of side-effects experienced by participants, which they attributed to their use of PIEDs, show similarity to the physical, behavioural, and psychological effects described within the literature (see Table 3). However, the findings of the present study did not examine any causal links between use of substances and side-effects, and there remains a lack of definitive clinical evidence surrounding the side-effects of steroids. While this ambiguity may hinder the development of interventions designed to minimise the harm associated with side-effects, the present study, as well as the wider empirical evidence highlights that PIED users perceive themselves as experiencing a broad range of adverse effects. Consequently, it would appear that in order to effectively reduce the harm stemming from the adverse side-effects of PIED use, a multi-tiered approach may be required.

Poly-drug use, including the combination of illicit drugs with alcohol, and sometimes, medicines and non-controlled substances, has become the dominant pattern of drug use in Europe (EMCDDA, 2011). Evidence from previous studies suggests PIED users frequently use other illicit substances (see Table 5) and the findings of the present study signify that a relatively high proportion of participants recently used illicit drugs, particularly cannabis, benzodiazepines, and cocaine. While examination of specific trends of concomitant use of PIEDs and other illicit substances were outside the scope of the present study, the accumulation of findings suggest that the harm reduction needs of this group may extend to the use of other substances.

The low rates of re-using, borrowing, or lending used injecting equipment and associated paraphernalia found in the present study are consistent with findings from international studies (e.g. Aitkens et al., 2002; Cohen et al., 2007; Day et al., 2008; Hope et al., 2013). Considering the association between such injecting risk behaviours and BBV infections, these findings are a positive sign. A possible

manifestation of the minimal level of injecting risk behaviours is the low prevalence of BBV infections found among the sample, which again is consistent with the low rates found in other studies (see Table 6). That being said, a high proportion of the sample had not been tested for BBVs previously meaning that the prevalence reported herein may represent a conservative estimate. Furthermore, the small proportion of individuals engaging in sharing of injecting equipment, coupled with the numbers injecting with other people and being injected by another person, suggest that there is the potential for hazardous injecting practices and a corresponding risk of BBV transmission. Additionally, the most prevalent injecting sites being used by participants (buttocks and deltoids) are hard to reach and intramuscular injection in to these areas requires a forceful injecting technique (Aitken et al., 2002). As such, injection tends to be imprecise and can lead to bleeding puncture wounds, thus heightening the risk for BBV infection. Such injecting practices may also cause injecting related injuries, as was evident in the experiences of individuals in the present study.

Taken in combination, the results emphasise the continued need for harm reduction interventions, such as education around injecting risk and safer practices, and providing access to regular BBV screening, in minimising the threat of personal and public health concerns related to injecting PIED use. As the establishment of harm reduction approaches emerged in response to the heightening incidence of BBVs and the identification of injecting psychoactive drug users as a high risk group (Butler, 1991), this development was primarily reactive in nature, and it has proved difficult to curtail the high prevalence of BBVs, particularly HCV, within this population (Ashton, 2003; & 2012). The current low prevalence of BBVs among PIED users represents the opportunity for a proactive approach to be taken in order to maintain this low prevalence, rather than reacting to

the prospective scenario when prevalence has escalated (Aitken et al., 2002).

The findings in the present study concerning the interaction between PIED users and harm reduction services highlighted that a high proportion of participants were attending services for the first time, which may be suggestive of further increases in the prevalence of PIED using attendees. Given that previous research has indicated that PIED users are reticent to use services for seeking information (e.g. Larance et al., 2008), a further significant finding of the present study was the relatively high proportion of attendees who were motivated to use services for the purposes of harm reduction advice. The qualitative findings describe that while interactions with harm reduction services were experienced as positive; there was a salient desire among participants for a specialist service, which was separate from other groups of IDUs. Such findings are indicative of debate within the wider literature as although there is relative general consensus regarding the potential for harm reduction approaches to be employed with users of PIED, the most appropriate and effective form of interventions remains a point of contention (e.g., see Kimergård & McVeigh, 2014).

4.4. APPRAISAL OF METHODOLOGY

In order to draw conclusions regarding the utility and reliability of the findings reported in the present study, an assessment of the research design and methodology is required. In this section, the contribution of these factors in arriving at findings is considered, and an evaluation of the methodological strengths and limitations is presented.

The utilisation of a mixed method approach was a considerable strength of the present study as the use of quantitative and qualitative approaches in concert facilitated examination of the profile of PIED users

accessing harm reduction services, while also exploring their perspectives around harm reduction service provision. The use of purposive sampling within the present study meant that the research was focused on PIED users who presented to harm reductions services. While this was a strategic decision made in the attempt to compile an evidence base which could be used to inform service provision, it meant that the pool of potential participants to draw from was relatively small, and moreover, limits the generalisability of findings to the wider population of PIED users.

The design of the research instrument was augmented by critically appraising instruments used in previous research and adopting appropriate items. Confidence in the research instrument is further bolstered by the inclusion of multiple researchers, with diverse areas of expertise, within the design phase. That being said, the instrument relied on self-report, and although this method is generally considered to be a reliable and valid form of gathering data relating to drug use and associated variables (Bell, 1998), there remains debate regarding the accuracy of self-report. Furthermore, it has been suggested that self-reported data regarding socially undesirable, illegal behaviours, or socially marginal attitudes, may generate inaccuracy and bias (Harrison, 1995). However, considering the data were collected in the context of a low threshold, non-judgmental harm reduction service, such concerns may have been somewhat offset. An area in the present study which may have been impacted by self-report was the results concerning BBVs. Given the lack of biological testing, coupled with the relatively small proportion of participants who had been tested, the results herein should be interpreted with caution.

A further limitation of the present study was that quantitative analyses were descriptive in nature and therefore, do not provide any inferential information. Similar limitations are evident with regard to the qualitative findings

presented as they were drawn from open ended questions rather than interview based data, which led to a lack in depth of perspective. Furthermore, individuals in the current study who were attending services for the first time may not have had the opportunity to fully experience services. That being said, the systematic approach to analysing qualitative data, as well as the inclusion of multiple researchers in the process of analyses, does contribute to a high level of confidence in these findings.

In summary, the research design, sampling, and instrument employed herein represent key strengths of the present study. However, there were also a number of noteworthy methodological concerns regarding the generalisability of findings, reliance on self-reported data, and lack of depth in terms of statistical analyses and qualitative data. In light of the dearth of previous research concerning harm reduction and users of PIEDs in an Irish context, the present study intended to provide an exploratory overview and serve as an initial building block from which to base further investigation. As such, it provides a useful examination of the phenomenon of PIED use, the divergent user characteristics and perspectives, and as discussed within the next section, speaks to a number of significant implications for future practice and research.

4.5. RECOMMENDATIONS

The findings of the present study spotlight the trend around the increasing prevalence of users of PIEDs attending harm reduction services. Within the following section, consideration is given to the implications of these findings in the form of a number of recommendations.

4.5.1. Recommendations for practice.

- As a group, users of PIEDs represent a minority at harm reduction services. The increasing prevalence of attendees, who are using such substances, means that harm reduction service providers, and

indeed drug and health services in the wider context, should expect to interact with this group.

- PIED users are a diverse group of individuals. Service providers should anticipate diversity among attendees who are users of PIEDs and endeavour to provide accessible, inclusive and culturally competent services, which recognise the issues facing individuals.
- The trend of users of PIEDs attending harm reduction services is a relatively new phenomenon and represents a major transition in the client base of such services. Professionals engaging with PIED users face several challenges in catering for the needs of this group, and therefore, the provision of specialist training and education is particularly necessary.
- Given the range of personal and public health concerns associated with the use of PIEDs, the need for harm reduction approaches to be integrated within a continuum of care is readily apparent. Interventions designed to minimise the risk of harm should include the provision of sterile injecting equipment, BBV testing and vaccination, and health services, as well as harm reduction education and advice on BBV infections and vaccinations, use of PIEDs, associated side-effects, injecting techniques, risk behaviours, diet and training, use of other illicit substances, and sexual health.
- Existing harm reduction services are traditionally geared towards users of psychoactive substances. Given the divergent profile and nature of substance use among PIED users, there is a need to develop a tailored approach in response to the profile of harm within this group. Expanding the range and nature of models of practice may serve to enhance accessibility, engagement, and effectiveness. In particular, the

implementation and assessment of a specialised PIED clinic on a trial basis may be a beneficial development at this time.

- The use of PIEDs is associated with a wide range of adverse impacts, which may manifest in physical, psychological, and/or behavioural domains. The varied needs of this group require integrative, multi-disciplinary approaches to be considered, with emphasis on developing inter-agency links and establishing care pathways between general health services, harm reduction services, and mental health services.

4.5.2. Recommendations for research.

- The evidence base surrounding the worldwide prevalence of PIED use is gradually expanding. There is however a deficit of knowledge surrounding the epidemiology of use in an Irish context. As such, population based surveys, which examine the national prevalence of use among adults and adolescents, would shed light on the patterns of use and provide a basis for policy-making and planning.
- The findings of the present study may not be representative of the profile and perspectives of users of PIEDs, who are not attending harm reduction services. Future research, which samples the wider population of PIED users, would provide a more comprehensive portrait.
- Findings concerning BBVs in the present study were based on self-report. In order to ascertain a definitive prevalence, future research which incorporates serological testing is recommended.
- In depth qualitative research would provide a deeper understanding of the experience and perspectives of PIED users, and would further facilitate the elicitation of their views regarding appropriate service provision.

- Future research exploring the perspectives of healthcare and harm reduction professionals would identify the challenges associated with engaging with PIED users and assess the feasibility of developing integrative, multi-disciplinary approaches.
- Research surrounding the effectiveness of existing harm reduction service provision within an Irish context is required to evaluate the capacity of services to minimise the harms associated with the use of PIEDs.
- Service provision in Ireland, and indeed internationally, appears to be hindered by the lack of public health policies and practice guidelines relating to the use of PIEDs. Research in this area is essential in order to inform policy and equip services with the infrastructure and tools necessary to provide effective interventions.

4.6. CONCLUSION

The present study aimed to examine the profile and perspectives of individuals attending harm reduction services who are users of PIEDs. The findings highlight that the profile of service users is made up of a diverse range of individuals, with the majority client group being males in their twenties, who initiated use of steroids in their late teens to mid-twenties. The group were using a wide range of injectable and oral steroids and ancillary substances, with the primary motivation of enhancing physical appearance.

The sample reported experiencing a range of side-effects, which they associated with their use of PIEDs. Although relatively frequent use of other illicit drugs was documented among a proportion of the sample, the prevalence of injecting risk behaviours and BBVs appears to be low. In their perspectives, experiences of harm reduction services had been predominantly positive, although there was a desire expressed for services to be enhanced, particularly around the provision of medical facilities. For many, attending services was an intimidating experience, which may have contributed to the desire for a facility that provides a separate service for users of PIEDs.

The present study has provided empirical evidence concerning the emerging trend of PIED users accessing services in an Irish context, and emphasises that this group has multiple harm reduction needs. Although the significant levels of risk behaviours and BBVs evidenced among other groups of injecting drug users do not appear to have been realised in this sample of PIED users, it may not be representative of the wider population of users, who are not attending services. Considering the methodological limitations of the present study and the sparse evidence base surrounding the interaction of harm reduction and PIED use in an Irish context, this research provides an initial overview and presents a number of potential directions for addressing the needs of this group. As such, it offers a useful platform in future deliberations surrounding the effective minimisation of harm associated with the use of PIEDs.

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