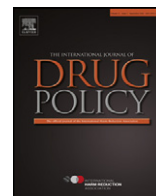




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Research paper

“A Costly Turn On”: Patterns of use and perceived consequences of mephedrone based head shop products amongst Irish injectors

Marie Claire Van Hout^{a,*}, Tim Bingham^b

^a School of Health Sciences, Waterford Institute of Technology, Waterford, Ireland

^b Irish Needle Exchange Forum, Ireland

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ABSTRACT

Background: Mephedrone injecting has recently been reported in Romania, Slovenia, Guernsey and Ireland. The research reported here aimed to describe the experiences of a group of Irish injecting drug users, who were injecting mephedrone based headshop products prior to the introduction of legislative controls in Ireland, with particular focus on pre- and post-legislative use, effects of injecting mephedrone, settings and contexts for injecting, polydrug use and serial drug injecting, risk perceptions and harm reduction practises.

Methods: Following a predevelopment phase with a Privileged Access Interviewer, in-depth interviews using a phenomenological approach were conducted with eleven attendees of a low threshold harm reduction service.

Results: The findings describe the abuse potential of these mephedrone based headshop products when used by intravenous injection. Although participants were aware of risks and safe injecting practises, compulsive re injecting with excessive binge use over long periods of time was common. Nasal to injection route transitions, intense paranoia, violent behaviour and aggression, emergence of Parkinson type symptomatology (in the form of spasms and ‘wobbling’), and permanent numbness in lower extremities were reported. Multi and serial drug injecting with heroin was used in efforts to manage the intense rush and avoid unpleasant comedown. Participants reported limb abscesses, vein clotting, damage and recession resulting from product toxicity, crystallisation of the products when diluted and flushing practises. Seven participants were homeless, with groin and street injecting common. Following legislative changes use of mephedrone products declined due to closure of headshops, increased street prices, concerns around contamination and the emergence of new street stimulant drugs.

Conclusion: Continued monitoring of drug displacement patterns in post legislative time frames is advised, alongside longitudinal ethnographic research to track the diffusion of mephedrone and other cathinone derivatives within injecting networks. Further investigation of the adverse health consequences of these drugs on injection is warranted.

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Introduction

The explosion of the new psychoactive drug market is of increasing public and academic concern (Hillebrand, Olszewski, & Sedefov, 2010; Schmidt, Sharma, Schifano, & Feinmann, 2010; United Nations Office on Drugs and Crime, 2010). Mephedrone (4-methylmethcathinone) is one such psychoactive drug designed to mimic the psycho-stimulant, hallucinogenic and empathogenic effects of cathinone, a compound derived from the Khat plant (Europol-EMCDDA, 2010; Kalix, 1992; Shulgin & Shulgin, 1991). It was first synthesised in 1929, reported in Israel in the early 2000s as ‘Hagigat’ (Urquhart, 2004) and was banned due to its acute

toxicity (Bentur, Bloom-Krasik, & Raikhlin-Eisenkraft, 2008). However, efforts to synthesise new unscheduled substitute cathinone drugs continued, with mephedrone re-emerging in mid 2003 (Power, 2009) and with online availability registered since 2007 (Camilleri, Johnston, Brennan, Davis, & Caldicott, 2010; Deluca et al., 2009; Psychonaut Web Mapping Research Group, 2009; Roussel, Perrin, Herard, Chevance, & Arpino, 2009; Vardakou, Pistos, & Spiliopoulou, 2011). By 2010, mephedrone was identified in all 22 EU Member states (Europol-EMCDDA, 2010). Popularity of this off-white crystalline powder (or capsules) amongst individuals seeking to achieve mind altering states of consciousness (i.e. ‘psychonauts’, Blom, 2009), early adopter gay and club dance scenes, and student populations are evident in a variety of European countries (Europol-EMCDDA, 2010; Psychonaut Web Mapping Research Group, 2009). These include Sweden (Gustavsson & Escher, 2009), the United Kingdom (Brandt, Sumnall, Measham, & Cole, 2010; Carhart-Harris,

* Corresponding author. Tel.: +353 51 302166.
E-mail address: mcvanhout@wit.ie (M.C. Van Hout).

King, & Nutt, 2011; Dargan, Albert, & Wood, 2010; Dick & Torrence, 2010; Measham, Moore, Newcombe, & Welch, 2010; Measham, Moor, & Østergaard, 2011; Measham, Wood, Dargan, & Wood, 2011; Newcombe, 2009; Schifano, Corkery, Naidoo, Oyefeso, & Ghodse, 2010; Winstock, Marsden, & Mitcheson, 2010; Winstock, Mitcheson, & Marsden, 2010; Winstock, Mitcheson, Deluca, et al., 2011; Winstock, Mitcheson, Ramsey, & Marsden, 2011; Wood, Davies, et al., 2010; Wood, Greene, & Dargan, 2010), Northern and Southern Ireland (McElrath & O'Neill, 2011; McElrath & Van Hout, 2011; McNamara, Stokes, & Coleman, 2010; Nicholson, Quinn, & Dodd, 2010; Van Hout & Brennan, 2011a, 2012), France (Debruyne et al., 2010; Lahaie & Cadet-Taiou, 2010; Roussel et al., 2009), Scotland (Torrance & Cooper, 2010), Slovenia (Pas, 2010) and the Netherlands (Brunt, Poortman, Niesink, & van den Brink, 2010). Research conducted in Australia also registers user interest, but not to the same degree as in Europe (Lea, Reynolds, & De Wit, 2011; Matthews & Bruno, 2010).

It appears that consumer driven demand for mephedrone coincided with poor quality and low availability of similar party drugs (i.e. MDMA and cocaine) (Psychonaut Web Mapping Research Group, 2009). Prior to the introduction of legislative controls over mephedrone in several countries (UK, Ireland, Denmark, Germany, Romania, Estonia, Norway and Sweden), interest in using mephedrone was linked to user perceived safety relating because of its legal status, competitive pricing, widespread online availability and perceived low potential for harm (Daly, 2010; Deluca et al., 2009; Hand & Rishiraj, 2009; Measham et al., 2010; Newcombe, 2009; Psychonaut Web Mapping Research Group, 2009; Ramsay et al., 2010; Van Hout & Brennan, 2011a; Winstock, Mitcheson, Deluca, et al., 2011). However, Winstock, Marsden, et al. (2010) observed that the legislative control of mephedrone in the UK had little effect on availability and rates of use. Academics have questioned how media promotion of mephedrone, alongside aggressive web based marketing and online user forums has played a role in its popularity (Psychonaut Web Mapping Research Group, 2009), and has hampered harm reduction efforts (Davey, Corazza, Schifano, & Deluca, 2010; Littlejohn, Baldacchino, Schifano, & Deluca, 2005; Measham et al., 2010; Schifano et al., 2006; Winstock, Mitcheson, et al., 2010).

Recent post legislative reports indicate mixed outcomes, with continued popularity of mephedrone evident amongst early adopter gay and club dance scenes in the UK (Measham, Moor, et al., 2011; Measham, Wood, et al., 2011). Reduced user interest in other cases are attributed to reports of negative user experiences on continued use, increased pricing and emerging availability of good quality MDMA and cocaine (Brunt et al., 2010; Carhart-Harris et al., 2011; Independent Scientific Committee on Drugs, 2010; McElrath & O'Neill, 2011; McElrath & Van Hout, 2011; Petroczi et al., 2011; Van Hout & Brennan, 2012; Winstock & Power, 2011; Winstock, Marsden, et al., 2010). Of interest is that research in the Netherlands indicated a decline in MDMA purity since 2008 and recently reported on the blending of mephedrone within MDMA tablets (Brunt et al., 2010). Reports also indicate that online products packaged as mephedrone also contain other constituents such as methylone, butylone, ethcathinone, fluoromethcathinone, methedrone ketamine, cocaine, amphetamine, caffeine and paracetamol (Camilleri et al., 2010; Europol-EMCDDA, 2010; Gibbons & Zloh, 2010; Kavanagh et al., 2010).

Mephedrone's chemical structure as substituted beta-ketoamphetamine with its psycho stimulant effect appears to act via increased release and reuptake inhibition of serotonin (5-HT) (Kehr et al., 2011; Schifano et al., 2011). Users report euphoria, energy, mood enhancement, talkativeness, music sensitivity, empathy, sociability, sensory enhancement, moderate sexual arousal and perceptual distortions similar to cocaine, MDMA, amphetamine and methylamphetamine (Brunt et al., 2010; Deluca

et al., 2009; Winstock, Mitcheson, Deluca, et al., 2011; Winstock, Mitcheson, Ramsey, et al., 2011). Intranasal and oral use remain most common, with user experiences complicated by poly drug using patterns, high and multiple dosages over prolonged drug taking episodes and/or the presence of underlying psychological disorder (Brunt et al., 2010; Carhart-Harris et al., 2011; Dargan et al., 2010; Deluca et al., 2009; Europol-EMCDDA, 2010; James et al., 2010; Mackay, Taylor, & Bajaj, 2011; McElrath & Van Hout, 2011; Odenwald et al., 2005, 2009; Van Hout & Brennan, 2011a, 2012; Winstock, Mitcheson, Deluca, et al., 2011; Winstock, Mitcheson, Ramsey, et al., 2011; Wood, Davies, et al., 2010; Wood, Greene, et al., 2010). Research underscores that mephedrone's potential for cravings, compulsive redosing and uncontrollable binge use (known as 'fiending') are attributed to its short duration effect (2–3 h) (Europol-EMCDDA, 2010). Its potential for acute sympathomimetic toxidrome (i.e. tachycardia, seizures, chest pain, sweating, blurred vision, agitation, brief psychosis and hypertension) is of concern, with mephedrone implicated fatalities recorded across Europe and the US (Dickson, Vorce, Levine, & Past, 2010; Ghodse et al., 2010; Gustavsson & Escher, 2009; James et al., 2010; Lusthof et al., 2011; Mackay et al., 2011; Past, Vorce, Levine, & Past, 2010; Regan, Mitchelson, & Macdonald, 2010; Torrance & Cooper, 2010; Winstock, Mitcheson, et al., 2010; Wood, Davies, et al., 2010; Wood, Greene, et al., 2010; Wood, Davies, Greene, et al., 2010).

Of interest for this work, is that some clinical presentations have reported on the injecting of dissolved mephedrone powder (Wood, Davies, et al., 2010). Prior research efforts on mephedrone have reported low rates of injecting, and are perhaps indicative of the specific groups under investigation (Carhart-Harris et al., 2011; Europol-EMCDDA, 2010; Lea et al., 2011; Matthews & Bruno, 2010; Winstock, Mitcheson, Deluca, et al., 2011; Winstock, Mitcheson, Ramsey, et al., 2011). Contemporary online user forums in 2011 (see www.blackpoppymag.wordpress.com; www.bluelight.ru; www.erowid.com) discuss user narratives of injecting experiences with mephedrone. Route transitioning towards injecting is often due to enhanced nasal sensitivity on insufflation, and perceived cost effectiveness, with users intending to administer lower dosages of mephedrone for a longer duration effect. Intravenous or intramuscular injection of mephedrone is advised at approximately 1/2 or 1/3 of oral dosage, with effects lasting approximately 30 min (Carhart-Harris et al., 2011; Deluca et al., 2009; Europol-EMCDDA, 2010; Wood, Greene, et al., 2010). Injecting outcomes per shot are reportedly intensely pleasurable, with a 'rush' of approximately 5 min and euphoric type effects lasting around 60 min, and with drive to compulsively re-inject higher doses (100–200 mg). Online user forums describe injecting side effects which include chest tightening, pupil dilation, nausea, cold extremities, heightened sexual arousal with inability to climax, paranoia, agitation and the development of abscesses at injecting sites. This notwithstanding and despite current legislative controls, reports of mephedrone and other amphetamine type stimulant (ATS) injecting in Romania, Slovenia, Guernsey and Ireland continue (see 'pervitin' in the Czech Republic, 'boltushka' in the Ukraine amongst others; Colfax et al., 2010; Europol-EMCDDA, 2010). Hence, the research aimed to describe the lived experiences of an Irish group of injecting drug users (IDUs) who were injecting identified mephedrone based headshop products prior to legislative controls.

Methodology

On the 11th of May 2010, the Irish government imposed a Declaration order under the Misuse of Drugs Act 1977 and 1984 banning mephedrone, methylone and 'related' cathinones,

synthetic cannabinoids, benzylpiperazine (BZP) derivatives, GBL and 1,4 BD, ketamine and Tapentadol. Prior to this, over 100 headshops selling mephedrone and other psychoactive substances operated, with many providing 24 h shop availability and city based delivery services in Dublin. Before conducting fieldwork, the Privileged Access Investigator (author number two) established contact and developed rapport with a number of adult individuals attending a low threshold harm reduction service in Dublin, and who reported injecting mephedrone based products bought in headshops in the period January to May 2010. Research has reported on the benefits of utilising Privileged Access Interviewing with hard to reach populations, and most particularly amongst IDUs, with Privileged Access Interviewers achieving access in situations where outsider access in the form of researchers would be viewed with suspicion and mistrust, and with optimum data retrieval in short periods of time (Albery, Strang, Gossop, & Griffiths, 2000; Boys, Marsden, & Strang, 2001; Gossop, Griffiths, Powis, Williamson, & Strang, 1996; Griffiths, Gossop, Powis, & Strang, 1993; Hausser, Kubler, & Dubois-Arber, 1999; Havell, 2004; Kuebler & Hausser, 1997; March, Oviedo-Joekes, & Romero, 2006; Powis et al., 1999; Santis et al., 2004; Stajduhar et al., 2004; Taylor & Kearney, 2005). Snowball sampling (Babbie, 1995) was limited to two referrals from each study participant, in order to reduce bias where several members of the same social network might participate in the study.

The chosen phenomenological approach (Holloway, 1997; Husserl, 1970; Kruger, 1988; Kvale, 1996) aimed to describe and garner rich understanding of the social and psychological phenomena as experienced by the participants themselves, and derived from their perspectives around the injection of mephedrone based headshop products. Participants were shown a poster board of headshop products which had been analysed by the Drug Treatment Centre Board to contain mephedrone as active constituent (Kavanagh et al., 2010), and which were recognisable to the participants by product packaging; 'The Business'; 'Diablo XXX'; 'Magic'; 'Blow'; and 'Wildcat'. Participants were asked to restrict their answers to the injecting use of these products. Eleven long and in-depth interviews (Boyd, 2001; Creswell, 1998) were conducted from April to June 2011. Interviews contained questions regarding pre and post legislative use, injecting effects and outcomes, settings and contexts for injecting, poly drug use and serial drug injecting, risk perceptions and harm reduction practises.

Ethical approval for the study was granted at Waterford Institute of Technology, Republic of Ireland in April 2011. Participants provided verbal consent (Holloway, 1997; Kvale, 1996) and were advised of anonymity, confidentiality and permission to withdraw if they wished. Interviews lasted between 1 and 2 h, and were conducted in semi public areas such as in parks and cars. The participants agreed a location for interview with the Privileged Access Interviewer. The interview questions were asked in conversational tone and without judgement, and were digitally recorded with permission.

Data analysis commenced during fieldwork with 'phenomenological bracketing' which involved asking the participants to describe and reflect on their injecting experiences with these products (Bentz & Shapiro, 1998; Caelli, 2001; Davidson, 2000). In addition, the authors' phenomenological immersion in the data via 'bracketing' of any preconceptions around mephedrone product injecting (Miller & Crabtree, 1992) aimed to reduce potential for bias, and allowed the authors to 'experience' the world of the users. Dated field memos (Caelli, 2001; Miles & Huberman, 1984) and detailed observational and analytical field notes (Lofland & Lofland, 1999) were made following each interview. Interviews were listened to and transcripts re read on several occasions, in order to achieve a holistic sense of the emerging data (the 'gestalt'), (Holloway, 1997; Hycner, 1999). Extensive briefing sessions were

held between authors, with a system of inter rater corroboration assisting in the delineation of units of meaning and the clustering of these units of meaning into emergent thematic patterns (Moustakas, 1994). 'Outliers' were analysed under conditions by which outliers could be interpreted by the authors (De Castro, 2003; Giorgi, 1985). Finally, the interviews were validated and summarised by incorporating the identified themes within the emergent holistic context.

Results

Participants described the injecting of selected mephedrone based headshop products within several small networks of IDUs in inner city Dublin. All participants (eight males and three females) were clients of a low threshold harm reduction day service. Seven participants were homeless (five males and two females), and all had a history of injecting and poly drug use. Six participants attended a methadone maintenance programme and reported that mephedrone was undetected in routine screenings;

I never told the exchange I was taking mephedrone, I just told them I was taking coke. The mephedrone never showed up in the urine analysis, that's how I got away with it. (**Female No 1, 27–31 years**)

Consumption choices, risk management and injecting practises

None declared at the day service that they were injecting mephedrone. All participants commented that good quality cocaine and ecstasy were unavailable prior to the legislative control of these products, which alongside positive peer reporting appeared to facilitate a consumer shift towards purchasing of these products in headshops. Most participants described that the legal status of mephedrone at the time, and 24 h availability of these products at attractive prices in headshops encouraged user experimentation, and for those in recovery reintroduced them to drug using and injecting circles.

I was clean at the time, until that came out. I was clean for a good year, I heard it was like coke, coke was always my drug of choice, everyone was telling me its exactly like coke, twice as strong do you know what I mean, I just said ah 'feck it'. I wasn't worried if I was searched going down the street, for me it was just like coke. . . and half the price of coke. (**Female No 1, 27–31 years**)

It was mind blowing, it was like getting ecstasy, but the best ecstasy I ever got and the best coke you ever got mixed together, like it was pure euphoria. You feel bullet proof, you feel on top of the world, there is nothing that can make you feel any better than you are at that time. (**Male No 7, 30–35 years**)

Six males and three females reported intravenous injecting of mephedrone on the first occasion, with no reports of either oral use ('bombing'), or subcutaneous or intra-muscular injecting. Two male participants reported intranasal use of these products (i.e. 'bumping' from a coin) the first occasion, and observed that injecting (known as 'turning on') occurred within three months, due to experiences of nasal burning;

The first time I used it, I snorted it, it burnt the nose off me, literally felt the burning sensation going up into your head, that's what turned me off snorting it, then I started injecting. (**Male No 6, 25–30 years**)

Most participants observed an awareness of potential harm and had experienced instances of both personal and peer overdose with mephedrone. Reported risks around injecting outcomes, optimum injecting and harm management practises were disseminated via peer networks of injectors. This contributed to initial attempts to gauge lower injecting doses, inject in groups and manage long lasting effects;

I was yeah, I was afraid to use it the first time, that's why I used it with a friend. There were so many stories you know what I mean, you put too much into you and you go over, they say you're better off having someone with you, at least they would be able to ring a bleedin' ambulance for you. **(Male No 1, 25–30 years)**

Injecting occurred alone in a minority of cases, and mostly in pairs or in group settings in isolated laneways, pub toilets and in flats. Homeless participants described how street injecting of mephedrone fitted easily into their daily circumstances;

You know the way people say cocaine is a rich mans drug, well mephedrone was a homeless persons drug, that is the way I seen it, it was easy to get. **(Male No 6, 25–30 years)**

All participants injected themselves. Partner injectors reported simultaneous injecting in order to experience the mephedrone 'rush' at the same time, with no report of sex effect.

The majority of participants appeared organised in their injecting practises and this was indicative of their prior injecting histories. All were aware of the safe disposal of injecting equipment, and did not report frontloading, or sharing of flush water and injecting paraphernalia. One participant reported sharing needles as last injector. All participants observed how the day service assisted in decision-making around needle and syringe sharp selection, disposal practises of used needles, and the provision of citric and filters. Several participants reported difficulties in dissolving products, with some 'cooking up' within citric packages, and others barrel shaking mixed with warm water.

Some of the stuff I used to take used to crystallise in the works, the more you heat you put to it, the more crystallize it gets, if you didn't get it into you before so many seconds it would crystallize. Always cooked up with citric, sometimes you could put it into the barrel and shake it, sometimes if I was desperate, I would use puddle water. **(Male No 3, 30–35 years)**

When I cook up, I cook my own up, if someone is with me they can cook their own up, empty the barrel, boil the kettle, put it into a cup, suck it up, 20 or 30 mls shake it real hard and it's a decent type of mephedrone, it will be pure see through. **(Male No 8, 25–30 years)**

All participants reported an intense burning sensation on injection. Continued attempts to inject resulted in vein blockages, with development of skin erosion, localised infections, blisters, spots, cold sores, abscesses, scabs, lumps, gangrenous tissue, blood clots and large holes at overused injecting sites. All participants reported flushing to attain a second hit, even though they were aware of resulting vein damage and inability to inject in that site again;

It left my arms in bits, sometimes I would put it in, and the only way I could describe it was like acid, that's what it felt like, when you're pumping it in, you can feel it burning, like its not meant to go in there, an actual burning sensation from it. **(Male No 2, 25–30 years)**

They [peers] keep pushing it and pushing it, even if it gets blocked, they will force it into them, even when I was doing it and it got blocked, I wouldn't force it, I would stop and take it out, you would see the blood clots, you see it does ruin your veins, it clots up your veins twice as fast as anything else. . .that's one thing I did learn fast from it, say you used one vein on it and got two hits out of it, you wouldn't get the vein again, you'd have to move onto a different vein to get another hit out of it, that's why everyone started using their groin. **(Male No 4, 30–32 years)**

Participants described being limited to two to three injections per site, and using 2 ml barrel orange or brown needles for arms and hands respectively, and 2 ml barrel blue needles when veins receded, and for groin injecting. There were no reports of neck injecting. Many participants favoured groin injecting in order to conceal track marks, holes, abscesses and scabs on arms and hands, and described how injecting cavities or holes assisted the convenience of injecting when on the street;

I don't have to look, I have a bullet hole in each leg, all I had to do was feel where the hole was and go straight in. **(Male No 6, 25–30 years)**

I nearly lost my leg over it . . .I'd say that's what caused my leg to swell up, cause because I ended up getting a clot on me groin and an infection, an abscess on my groin, doctors told me I was lucky to come in, if you hadn't of [have] come in, in the next few days, you would have lost your leg. **(Male No 1, 25–30 years)**

Injecting cycles and polydrug use

Once injecting mephedrone, all participants described intense cravings to re-inject compulsively within each injecting episode, which reportedly lasted several days and in some instances weeks, with little respite, and with all participants describing such patterns continuing for long periods of time (six to 18 months). The majority of participants described profuse sweating and weight loss, as a result of frequent excessive injecting cycles and personal neglect of hydration, sleep and food intake;

The effect. . .it was similar to cocaine, it was more intense, after you would want more, more and more, until basically I had no money left. what it done to me, it ran me down like, it tore me apart like, I gave up on everything else apart from getting that, getting that all the time, I never snorted, **I injected.** **(Male No 2, 25–30 years)**

My longest spell would have been 1½ years every day, four or five times a day, ½ gram, if you saw me then, I would have looked like a skeleton, I looked like death warmed up, withered away. **(Male No 7, 30–35 years)**

It was chasing the first hit, constantly using, using, using, using, and the weight just falls of yer' [you]. I was using for about three months and lost about three stone, I went from 13 ½ stone to nine stone, I never ate, I never drank fluids. **(Male No 3, 30–35 years)**

I wasn't looking after myself, I was letting myself get dirty, not bothered about anything else. **(Male No 2, 25–30 years)**

Injecting dosages ranged from ¼ to 1½ grams per shot, with participants describing an initial potent euphoric 'rush' characterised by feelings of intense chest pressure and with palpitations

lasting 2–3 min. This was followed by a stimulant effect which could last for days. Participants described injecting between five and ten shots per day, with dosage increasing incrementally as tolerance increased, in efforts to achieve ‘first time’ effects;

The rush. . .you’re holding on, it’s like a roller coaster ride then you’re talking and screaming, it’s mad, its very intense. It’s a lot stronger than cocaine, you can feel your heart about to explode. You would be up for hours dancing and doing mad things, hearing voices and seeing things, in your arm, in your leg, in your groin, just trying to get that hit, just to get that rush. It’s a very dangerous drug, it’s very intense the rush. (**Male No 7, 30–35 years**)

I went from ¼ gram to one gram a time chasing the first hit again. You never hit the first hit again, always chasing, chasing and chasing, that’s what it’s all about. (**Male No 1, 25–30 years**)

The turn on [injection] buzz wouldn’t be over when we wanted more, out of all the drugs I have tried, this was something I wanted more and more and more, it’s just so addictive. (**Female No 2, 35–40 years**)

Serial drug injecting practises using heroin alongside mephedrone was common and used to temper the mephedrone induced rush. One male participant reported multi drug speed-ball injecting with mixes of both heroin and cocaine along with mephedrone.

When I injected it, I thought wow this is brilliant, its like 50 pints all in one as the night went on, I injected more and more, I just got so out of my face, I couldn’t handle it, I needed a turn on [injection] of heroin to come down, and then as soon as I did, I needed another turn on [injection] from the other stuff to go back up. (**Female No 3, 35–40 years**)

I was using heroin as well, I was using three drugs at one time, I was using heroin, I was using mephedrone and I was using methadone. I would inject heroin to come down, sometimes that wouldn’t really take you down off it, so you would drink methadone. I would be cursing myself, I want to come down of this bleedin’ shit, its horrible its doing me head in, it’s a horrible drug, even talking about it makes my skin crawl its that horrible chemical feeling its horrible. (**Male No 1, 25–30 years**)

No participants reported physical withdrawal symptoms. Alcohol, methadone and benzodiazepines were in some instances consumed orally to manage unpleasant comedown symptomatology, which included restlessness, insomnia, paranoia, nausea and anorexia. Several participants described negative psychological comedowns grounded in the realisation that product supplies were used up, along with an intense craving to inject again, and the need to return to local ‘headshops’;

The come down is horrible, its horrible, I don’t know how to explain it, how can I describe it, not that you want to kill yourself, but not that far off that kind of a really, really low. .You would want more. . . where will you get more, but when you knew you has no money left and no way of getting money, that was when the come down was horrible, but for me if I knew I had money at home or whatever or I knew I had money somewhere the come down wouldn’t be too bad because I knew I would be able to get more, I could top up. (**Female No 1, 27–31 years**)

Injecting outcomes

Several participants described an immediate unpleasant chemical taste in their mouth on injection, which was also described on insufflation, but appeared more potent and instant on injecting. The post ‘rush’ sweating also emitted a similar offensive chemical odour;

The effects I got off it was a horrible dirty chemical feeling off it, I felt real dirty on it, it didn’t matter how many times I used it, always felt that dirty chemical feel, taste in your mouth, it was like a taste of burning rubber, it was something like that. (**Male No 1, 25–30 years**)

It’s so powerful, it takes over the whole body and then that dirty sweat coming out of you. . .and stinks, the odour off you in the morning is horrible, you would need a shower to get the dirty odour off you, very dirty smell. (**Male No 6, 25–30 years**)

Most participants described a ‘wobbling’ phenomenon occurring on injection which was not reported on insufflation, and was particularly common in participants who injected these mephedrone based *headshop* products compulsively over longer periods of time (over six months);

I was snorting it . . .because it was burning the nose off me. . .he [friend] said you are better off turning it on [injecting], I said I am not really into that big rush, he said it’s not really like a big rush, he said you start getting the wobbles, so I said I will put a tiny bit it in, I put it into water, shook it up and put it into me, it was like I was having a epileptic fit, I was there shaking like mad, what the fuck am I overdosing here, he said no, just grab onto something, he said that’s what happens to you when you inject it. (**Male No 6, 25–30 years**)

I was using it in my groin on my right leg, used to put it in me, I used to start wobbling and I couldn’t focus and my eyes were all over the shop. (**Male No 1, 25–30 years**)

Several participants reported the presence of long lasting spasms, numbness and loss of pain sensation following these ‘wobbling episodes’, which they attempted to self-manage with street and prescribed benzodiazepines. It was notable that such symptoms did not deter from continued and compulsive re injecting;

Some of them [peers] were saying it was starting to effect their body badly. . .they were getting jumps [spasms], that’s when I used tablets, the body starts jumping and aching. My body and mind was all over the place, there were times I would look up and say take me, take me, I can’t do this and when I came down, I was going to get more. (**Male No 4, 30–32 years**)

I could peel my toe nail off without it hurting, what ever it was doing to my body, my body was in bits, I ended up in spasms, legs and all locked. I was in the psych clinic for three weeks over that stuff, they were sticking needles in my arms and legs, there was no feelings. I have done nerve damage to the leg, it’s all numb. (**Male No 3, 30–35 years**)

All participants described the onset of paranoia and long lasting psychotic symptomatology following injection of mephedrone, with several participants reporting psychiatric admissions following injecting binges. Of note is that the two participants who commenced with intranasal use, reported that intense paranoia onset occurred only after progression to injecting;

I used to walk up the street saying he's 'old bill', he's 'old bill', mad paranoia. It would last for hours. . . still thinking that there was someone out there to get me, any time I took a turn on [injection] I would be like that even in the hostel. . . when you're on it, you think everyone is looking at ye [you], you walk out of a lane way and automatically you think everyone is looking at yer [you]. It's the worst drug I have seen in Dublin. It's out of the window, I wouldn't call it a drug, I'd call it a psychotic drug, its very psychotic, like I am still psychotic over it, I cannot let anyone sit behind me, I have to be sitting against the wall. (**Male No 3, 30–35 years**)

The first two times on it, it was a buzz afterwards, just got real paranoid, everything you thought was there, wasn't there, it was crazy, not good. When the paranoia started setting in, you would see things that weren't there and hear things that weren't there. There was no way off it, once you were on it, you would have to see it through, there was nothing that would bring you off it. (**Male No 4, 30–35 years**)

Several participants observed that this heightened and long lasting sense of paranoia contributed to elevated levels of aggression and participation in violent criminal acts;

If two guys are fighting when wired they wont stop fighting until one of them is dead, that's the truth, it's a very violent drug, even one of the street coppers said that he hadn't seen the height of street robberies since the 'head shops' opened. If I thought I was right and you thought I was wrong, I wouldn't think twice about sticking a blade in yer [you] and walking away from ya [you], do you know what I mean. A guy grabbed me and said that I had ripped him off, I was just going to grab him and slit his throat, only because a feller said copper behind yer [you], I threw the blade away, otherwise I would have cut the blokes throat, I would have been doing a life sentence now. (**Male No 3, 30–35 years**)

I was in a relationship when I was chasing it, I found it made my partner very violent, if he hadn't got it and made me prone to going out robbing anything, just so that it would stop the violence. It made me feel anxious because he was violent, I was afraid I would have literally robbed me granny to get the money for it, to stop what was happening at home. (**Female No 2, 35–40 years**)

Mephedrone has ruined my life, its made me more paranoid, I am facing God knows how long in jail. (**Male No 8, 25–30 years**)

Post legislative trajectories

Many participants reflected on how 24 h availability of mephedrone in headshops located in close proximity exacerbated dependencies on these products;

Get up in the morning, go to the clinic, get my methadone, go into one of the shops probably get 2 grams, go back to the gaff [flat], have a small turn on [injection], just to wake up, obviously I would be awake but it was a wake up turn on [injection], she would have a turn on [injection] as well, after a while then, we would have the big one and sit there listening to a few tunes. (**Male No 8, 25–30 years**)

I would use in the morning, I would be wired all day and then in the evening I would use two or three times a day, the shop was open 24 hrs, so you could get loads of turn ons [injections] during the night as well. (**Male No 3, 30–35 years**)

Nine participants reported ceasing use of mephedrone based *headshop* products after May 2010. All participants reported satisfaction that headshops were closed, and commented that the resultant lack of 24 h availability of quality mephedrone based products alongside negative physical and psychological experiences of injecting helped reduce and cease use. Other factors included price increases from €20 per gram (sold in ½ gram packets) in pre legislative headshops to €20–30 per ½ gram on the street, and user concerns for street product contamination. However, all participants reported post legislative awareness of street and internet mephedrone product availability. Three participants reported switching to other synthetic stimulant products (*Ivory Wave*; *Snow Blow*) and described these products as having options around routes of administration with packages clearly identifiable in the form of injectable (silver packet) and smokeable (black packet) powders.

Discussion

To date, no qualitative studies have explored the injection of mephedrone based products and most studies have focused on 'early adopter' gay and club dance, psychonaut and student cohorts. Similar to research on the injecting of ecstasy (Degenhardt, Barker, & Topp, 2004; Gowing, Henry-Edwards, Irvine, & Ali, 2002; Green et al., 1995; Hunt, Jones, & Shelley, 1993; Topp, Hando, Dillon, Roche, & Solowij, 1999; White et al., 2006), this research serves to provide a previously unexplored context to the injection of mephedrone. Mephedrone was not the first drug ever injected (Topp et al., 1999) and preferences for injecting may have stimulated these individuals to inject these products once available on Irish drug scene (Dunn, Degenhardt, & Bruno, 2010; Evans, Hahn, Lum, Stein, & Page, 2009; Gossop, Stewart, Marsden, Kidd, & Strang, 2004; Shah, Galai, Celentano, Vlahov, & Strathdee, 2006). The presence of micro environmental factors stimulating a shift towards injection of mephedrone included mephedrone's legal status (at that time), 24 h availability, attractive pricing, perceived similarities to good quality MDMA and cocaine, decline in heroin availability in Dublin, normalisation of injecting drug use, homelessness and experiences of social exclusion. In this way and similar to that of ecstasy, the available mephedrone appeared to represent an extension of intravenous use of other substances amongst this group of injecting drug users (Topp et al., 1999). The lack of mephedrone detection for those on methadone maintenance treatment (McNamara et al., 2010) also appeared to facilitate reintroduction to known injecting networks. The authors recognise that the identified *headshop* products may have varied in purity, and that potential contamination during preparation for injecting or use with citric may have influenced reported outcomes. The development of drug rituals and every day routine social contexts for injecting appeared evident in terms of the purchasing, preparing and injecting of mephedrone based products. While none were novice or new initiates to injecting, injecting of mephedrone appeared to be supported via an informal peer network of injectors offering advice around optimum dosages, risk avoidance, safe injecting practises and comedown management (see also Harocopos, Goldsamt, Kobrak, Jost, & Clatts, 2009; Lankanau, Sanders, Jackson Bloom, & Hathazi, 2007; Treloar & Abelson, 2005a, 2005b). On a positive note, participants appeared organised in their preparation, injecting and disposal practises, with no reports of direct or indirect sharing of injecting paraphernalia (with exception of one 'last sharer', see R'acz, 2005), or selective risk taking amongst partners and close friends (Bryant, Brener, Hull, & Treloar, 2010). Similar to other research, injecting occurred most commonly in group or partner contexts, and frequently in public places, such as laneways and public toilets (Chintalova-Dallas, Case,

Kitsenko, & Lazzarini, 2009; Galea & Vlahov, 2002; Neale, 2001; Rhodes, Kimber, et al., 2006; Rhodes, Stoneman, et al., 2006). Of interest and in contrast to the current literature on mephedrone as a party and internet drug, is that seven of the participants were homeless, with reference made to these mephedrone based products being the ideal 'homeless persons drug'. Injecting in public places is often viewed as a response to homelessness, drug craving and opportunity (Fitzgerald, 2005; Fitzgerald et al., 2004; Neale, 2001; Parkin & Coomber, 2010, 2011a; Rhodes, Watts, et al., 2007). Indeed, some Dublin based charities had reported concern with regard to the injection of such products amongst the homeless in late 2009 (see www.dublinpeople.com). Both street and stimulant injecting are associated with greater potential harms (such as described by these participants) relating to high risk injecting sites, compulsive re-injecting at incremental doses, multidrug or serial drug injecting, overdose and environmental contamination (i.e. puddle water) (Darke, Kaye, & Ross, 2001; Hayashi et al., 2011; Hunt, Lloyd, Kimber, & Tompkins, 2007; Kaye & Darke, 2004; Klee & Morris, 1995; Parkin & Coomber, 2010, 2011b; Richard, Mosier, & Atkinson, 2002; Ropelewski et al., 2011; Small, Rhodes, Wood, & Kerr, 2007).

Decisions to inject mephedrone were grounded in anecdotal reporting of the intense euphoric 'rush' and longer lasting effect. Interestingly, and perhaps indicative of both IDU backgrounds and socio-economic circumstances, no participants reported oral use, given that oral dosages are usually higher than intranasal (Sumnall & Wooding, 2009). There were no reports of subcutaneous or intramuscular injecting (Wood, Davies, et al., 2010) and participants (with exception of two intranasal participants) injected intravenously on first time use. Participant concerns for nasal abrasion on insufflations stimulated injecting use within several months (in contrast to Newcombe, 2009 who reported user reluctance to inject due to these very concerns). Prior research has primarily focused on how intranasal and oral repeated dose administration of mephedrone increases the risk of abuse potential (Europol-EMCDDA, 2010). In this research, participants quickly realised that mephedrone did not represent 'getting more bang for the buck' (Harocopos et al., 2009, p. 220). Its short lived duration of effect (Deluca et al., 2009; James et al., 2010; Sumnall & Wooding, 2009; Winstock, Mitcheson, Deluca, et al., 2011) contributed to compulsive re-injecting at incremental doses higher than recommended oral and intranasal doses. Participants reported using between ¼ and 1½ grams per shot, with five to ten shots within each injecting cycle. They were frequently unable to inject in the same site twice due to vein damage, thrombosis, bacterial infection, abscesses and gangrene (Bridge, 2010; Hagan et al., 2001; Hagan, Thiede, & Des Jarlais, 2004; Lloyd-Smith et al., 2008; Maliphant & Scott, 2005; Rhodes & Kimber, 2007; Rhodes, Stoneman, et al., 2006; Rhodes, Briggs, Kimber, Jones, & Holloway, 2007; Salmon et al., 2009; Scott, 2005; Small et al., 2007; Zador, 2007). Participants also described flushing practises, the use of citric, and groin injecting when other sites became problematic (Darke, Ross, & Kaye, 2001; Maliphant & Scott, 2005; Miller et al., 2009).

Injecting outcomes and harms were similar to those observed in ecstasy and other stimulants (Degenhardt et al., 2004; Hunt et al., 1993; Topp et al., 1999). The intense rush experienced on injecting mephedrone resulted in chest pressure, palpitations, sweating, restlessness, agitation, shaking, paranoia and numbness in lower extremities (Al-Motarreb, Al-Kebisi, Al-Adhi, & Broadley, 2002; James et al., 2010; Lusthof et al., 2011; Mackay et al., 2011; Regan et al., 2010; Nicholson et al., 2010; Thomas, 2010; Winstock, Mitcheson, Deluca, et al., 2011; Wood, Davies, et al., 2010). Participants also reported an instant unpleasant chemical taste in their mouths on injection, with post 'rush' sweating emitting a similar odour (Psychonaut Web Mapping Research Group, 2009). Bearing

in mind mixed results with regard to mephedrone user reports of blue extremities (Dargan & Wood, 2010; Dick & Torrence, 2010; Wood, Greene, et al., 2010), participants did not describe this, but reported numbness and loss of pain sensation in lower extremities indicating peripheral vasoconstriction (Broadly, 2010). Of particular interest is the description of a 'wobbling' effect commencing shortly after injection of these mephedrone based products, which did not occur with intranasal use. Research shows that injection of meth-cathinone is associated with persistent and rapid onset manganese induced Parkinson type symptoms (Manganism) indicative of dopaminergic toxicity and with risk of permanent encephalopathy (Chintalova-Dallas et al., 2009; De Bie, Gladstone, Strafella, Ko, & Lang, 2007; Degner et al., 2000; Meral, Kutukcu, Atmaca, Ozer, & Hamamcioglu, 2007; Sanotsky et al., 2007; Stephens et al., 2008). Continued injection of these mephedrone based products also appeared to exacerbate acute and long lasting paranoia, with intense agitation leading to aggressive and violent behaviour (Lusthof et al., 2011; Mackay et al., 2011).

Although several female participants were initiated into mephedrone injecting by partners (Harocopos et al., 2009; Sherman, Smith, Laney, & Strathdee, 2002), there were no descriptions of stimulant sex effect (Booth et al., 2008; Braine, Des Jarlais, Goldblatt, Zadoretzky, & Turner, 2005; Chintalova-Dallas et al., 2009; Semple, Zians, Strathdee, & Patterson, 2009). Previous research has indicated a moderate to high dose dependent sex effect on oral and nasal administration (Van Hout & Brennan, 2011b; Winstock, Mitcheson, Deluca, et al., 2011). Serial and multi drug injecting of heroin and cocaine with mephedrone were described, with the oral use of benzodiazepines, methadone and alcohol also used to manage comedown symptomatology (Hayashi et al., 2011; Kerr et al., 2010). Physical withdrawals were absent, but participants described a drive to purchase more mephedrone in the 24 h headshops. However, the ability 'to drop in and out' of mephedrone injecting appeared possible after legislative changes and the closure headshops, concerns for contaminants in street mephedrone, and price increases (similar to Winstock, Marsden, et al., 2010) contributing to a decline in use. Coinciding with other Irish research, a user shift away from mephedrone in post legislative timeframes was described (Van Hout & Brennan, 2012). This shift may also have been supported by the lack of physical withdrawal, with participants appearing content to either return to methadone maintenance treatment, continue with injecting of opiates and other street products ('Snow Blow'; injectable and smokable 'Ivory Wave') or change routes back to oral and nasal use. In addition and similar to research on ecstasy, these injectors may have changed routes in response to the intense rush on injecting, concerns around product contamination and purity, development of dependence, uncomfortable comedowns and emergent health issues (Topp et al., 1999). Post legislative studies have observed the emergence of new products on mephedrone control (i.e. naphyrone, MDai methedrone, methylone and methylenedioxypropyrolvalerone [MDPV]) (Brandt et al., 2010; Durham, 2011; Schifano et al., 2011; Townsend, 2010).

The research has implications for the continued monitoring of drug displacement patterns in post legislative time frames and recommends longitudinal ethnographic research to track the diffusion of mephedrone and other cathinone derivatives within IDU networks. Further investigation of the adverse health consequences of these drugs for the injecting user is warranted.

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