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Illicit Fentanyl use in Rural Australia – An Exploratory Study

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Abstract

Introduction and Aims: Australia has seen an increase in the non-medical use of fentanyl transdermal patches (FTP) and associated deaths, with an over-representation of deaths in rural areas. Non-medical use of FTP involves high risk preparation and administration methods. However, no rural Australian drug user-focused research has been published to date. Frontline workers are without up-to-date harm reduction information. This study aimed to explore the perceptions and experiences of individuals using FTP for non-medical purposes.

Design and method: Interviews were conducted with adult participants (n=12) who had injected FTP twice or more and resided in regional/rural NSW or Victoria. The thematic data analysis identified key points around participant's harm reduction practices, perceptions and experiences with using FTP.

Results: Fentanyl was easily obtained in rural locations. Study participants described high risk preparation and administration methods. Misinformation shared across peer networks was likely to contribute to overdose.

Discussion and Conclusion: Beliefs and practices about obtaining and using fentanyl are transmitted and reproduced across groups of illicit drug users, amplifying and distorting information about methods and harms of fentanyl use. However, fentanyl injectors were experienced illicit drug users who perceived they had good knowledge of ways to use fentanyl safely in spite of knowing people who had died from overdose. It is unlikely this group would seek out harm reduction information. Peer networks are critical sites of harm reduction action that are challenging to infiltrate in the rural context where dispersed populations, distance and risks associated with disclosing illicit drug use are significant barriers to disseminating harm reduction information. Peer-to-peer education is a cost-effective method of disseminating correct health information and harm reduction messages in dispersed and isolated populations.

Keywords: Fentanyl; Prescription opioids; Peer-education; Rural Australia, Harm reduction

Introduction

Fentanyl is a synthetic opioid with powerful pain killing and tranquillising properties which is determined to be approximately 100 times stronger than morphine [1]. Pharmaceutical opioids have an important place in medicine for pain relief, particularly for illnesses such as cancer and for palliative care [2]. However, Australia has seen a steady increase in the prescribing and non-medical use of prescription opioids, most recently fentanyl, in the form of long-acting patches called fentanyl transdermal patches (FTP) [3,4].

In 2006 the Australian Pharmaceutical Benefits Scheme (PBS) expanded the authorized indications for the use of FTPs from palliative care to include non-palliative pain [2]. Since 2006, the only form of FTPs available in Australia are the "drug in adhesive", or matrix patch, where fentanyl is contained in the adhesive that holds the patch on the skin. The matrix patch is designed to deliver the drug preparation through the skin over the period of 72 hours [5]. In 2009, a total of 454,079 units of FTPs (each unit containing 5 patches) were recorded on the PBS, and in 2010 this increased to a total of 555,024 units [6,7]. In 2013, FTPs ranked thirty third on the list of highest cost PBS Drugs.

Increasing concern over fentanyl misuse has been documented in globally [8-10]. In the U.S., authors have linked a reduced supply of heroin due to law enforcement strategies to an increase in the use of prescription opioids and subsequent FTP overdoses [11,12]. In Australia, whilst heroin is the leading cause of opioid related deaths, prescription opioid deaths have dramatically increased over the last twenty years and continue to rise [13].

In Australia, deaths associated with extra-medical prescription opioid use appear to be mostly attributable to individuals who have not been prescribed opioids, yet limited data is available on diversion methods [4,14]. From 2000 onwards, the deaths in Australia associated with FTP have increased [4]. Between 2000 and 2011, 136 FTP-related deaths were recorded. The results of a coronial investigation indicated that around one-third (34%) of the overdose deaths were due to FTP toxicity alone, half (54%) had a history of IDU and two thirds (64%) had not been prescribed FTP [4]. Additionally, the deaths appear to be over-represented in rural areas and areas indexed with high levels of disadvantage, particularly in the Australian state of Victoria [3,4,15]. In rural Australia injecting drug use is as common as it is in urban areas and some drug use is more prevalent [16]. However, harm reduction strategies are not as widely used or available in rural areas; and health care in general is under supplied [17-19].

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Harm reduction strategies aim to prevent or reduce the severity of problems associated with the non-medical use of dependence-producing drugs such as fentanyl [20]. The principle of harm reduction was proposed by the World Health Organisation in 1973 as an alternative to drug control, which had proven unsuccessful in preventing illicit drug use [21]. The harm reduction approach is based on human rights principles that acknowledge vulnerability of some population groups to increased harms from drug use because of age, gender, life experiences such as incarceration and socio-economic disadvantage such as that experienced in rural Australia [22].

Most harm reduction approaches are inexpensive, easy to implement and have a high impact on individual and community health. Harm reduction benefit is maximised when low-cost/high-impact interventions are chosen over high-cost/low-impact interventions such as policing [23]. Under the Australian National Drug strategy, harm to communities, families and individuals is reduced through broad ranging initiatives such as drink driving legislation, the provision of drug and alcohol treatment services, and community education [6,7]. However, the strategies employed by Australian Governments have been criticised for providing more funds to criminalising illicit drug supply and demand; and lesser funds allocated to provide evidence-based and cost-effective harm reduction strategies such as opioid treatment therapies and encouraging safer injecting practices [24].

Harm reduction principles assume that some people will continue to use drugs regardless of the risks and that health workers will be able to share the least harmful ways of doing that [24]. As available drugs and methods of use change, knowledge amongst drug users and health workers needs to be updated to maintain effective harm reduction practices. An increase in fentanyl related overdoses and deaths suggests that information about how to reduce harms associated with injecting fentanyl is lacking.

There has been no published Australian research on how people inject fentanyl. Information on safer preparation methods is not available for Australian fentanyl users. A recent qualitative study in Toronto indicated that people injecting fentanyl noted that the substance was unpredictable in potency and users engaged in practices that exposed them to blood-borne viruses [8]. Options for delivering harm reduction information to fentanyl users are lacking. Ideally these strategies should be context specific and developed in conjunction with the target population [25]. This study explored how and why people in rural Australia obtained, prepared and injected fentanyl with the aim of developing harm reduction strategies that could be implemented in rural areas.

Method

Ethics

The study was approved by the NSW Health Greater Western Area Human Research Ethics Committee (no. HREC/14/GWAHS/25) and the Charles Sturt University Human Research Ethics Committee.

Context

The research project was planned and implemented by a group of people with experience in drug and alcohol treatment and research. Deaths from fentanyl overdoses were occurring frequently in their respective practice locations across several large regional centres and small rural towns in NSW and Victoria. There was no harm reduction information available for fentanyl users or drug and alcohol workers in these areas. Anecdotal reports suggested fentanyl was readily available within drug using groups and was increasingly popular in spite of overdose deaths [15].

Given the hard to reach nature of rural fentanyl users and the lack of information available about their drug use experiences, a qualitative design was selected as the best way of developing an understanding of illicit fentanyl practices. In-depth, semi structured interviews were chosen as the key information collection strategy [26].

Flyers were distributed to rural needle and syringe and opioid treatment programs and a medicated withdrawal program in three regional centres in rural NSW and Victoria. To be eligible to participate in the study, people had to be over eighteen, speak English, usually reside in a rural location and have used fentanyl for non-medical purposes more than once. The flyers included a contact phone number of the researcher conducting the interviews and prospective participants were asked to call for more information and to arrange an interview time if they wanted to proceed. Both men and women were sought for interviews with the aim of achieving 30% female participation to represent the ratio of deaths from fentanyl overdoses, which is 70-30 male to female [4].

Fourteen study participants were recruited and interviewed between April and June 2014. To ensure anonymity, participants agreeing to be interviewed did not complete written consent and verbal consent was obtained on a digital recorder at the start of the interview. A $50 supermarket voucher was provided to study participants to reimburse them for their time. Interviews of 40 to 60 minutes asked about methods of acquiring and using fentanyl, reasons fentanyl was chosen and the physical, mental and social benefits and harms experienced due to fentanyl use. One interview was not completed because the participant had not used fentanyl more than once and one was subsequently not included in the analysis as the participant did not usually reside in a rural area. Participant demographics are listed in (Table 1).

Recordings were transcribed verbatim into word documents and imported into NVIVO10 (QSR, 2012). Data collection and analysis was conducted concurrently. During analysis of the first two transcripts new areas of inquiry were identified and added to the interview schedule. For example, injecting drug use history and whether participants chose fentanyl and sought it out; or used it when they could not get anything else emerged as important themes in FTP use. The researcher who conducted the interviews undertook the preliminary data analysis coding answers to each theme and adding new themes as required. Another researcher coded the data independently to validate the coding and research team meetings were held fortnightly to discuss the way themes were developing and determine if new areas of inquiry were required.

Data was analysed thematically with the aim of developing themes that reflected the participant's practices of obtaining and using fentanyl, and theories and explanations they constructed for the risks and benefits of fentanyl use. Participant discourse in the form of processes and actions was central to the data analysis because it described social practices and behavioural norms of illicit drug use [27]. The approach taken to analysis was iterative rather than linear, involving four different although highly interconnected steps: (1) familiarization, (2) identification and coding of themes, including comparisons within case and cross case, (3) categorization and (4) interpretation and understanding [28]. Theme saturation was reached when the research team believed that each theme was adequately explained [29].

Sex		**Living circumstances**		**Cultural background**	
M	8	Regularly housed	8	Non Indigenous	9
F	4	Homeless	4	Aboriginal	3
Preferred drug		**Main source of income**		**Current Drug treatment**	
Fentanyl	4	Unemployment benefits	6	Residential Withdrawal	5
Heroin	6	Parenting benefits	3	Opioid Treatment	5
Poly substances	1	Full-time employment	2	Residential Rehabilitation	1
Methamphetamines	1	Disability payments	1	Community support	1
Region of usual residence				**Age**	
Murrumbidgee/Victoria			5	Age range	24-55
Western NSW			5	Mean age	35
New England			2		

Table 1: Study participant demographics.

Results

At the beginning of each interview participants were asked to talk about themselves and their current circumstances and about their injecting drug use experiences. All had been injecting drug users for many years and had considerable experience in obtaining and using opioids including fentanyl. Table 2 summarises the participants injecting drug use histories.

Obtaining fentanyl

Fentanyl was described as easily obtained from General Practitioners (GPs). Most of the study participants brought fentanyl from local drug dealers or other drug users who had obtained it from GPs. Only two participants said they had been prescribed it. For example;

Q: How would you usually get a hold of it?

A: "*Buy it off the street just through dealers that get it...I think they buy it off other people that are prescribed it, that's what I'm aware of anyway.*" – Tammy

"I've always used it through people who've got it themselves. I haven't got it personally, but I know it's easy to get"- Liam

There were multiple drug dealers accessible to participants, even in the smallest towns;

Q. How many would deal fentanyl?

A. How many would deal fentanyl? Four

Q. What's the size of your town?

A. 3000 – Troy

Most participants discussed doctor shopping that other drug users they associated with had engaged in or they talked about an example in the third person. For example;

"*It just depends how gullible the doctor is or how much time he's got, whether he just wants to give it to you and piss you off. They don't even ask you really why you're there to get it, it's more the concern of what drugs you want, it's not what the problem is... they go in and say to the doctor that they've been down here from Melbourne or something, and ra, ra, ra, and they can't get back to Melbourne until Monday or Tuesday or something like that, "We're on patches, ra, ra, ra," shit like this, and then the doctor will say, "Alright we'll do you up one or two patches until you can get back to Melbourne." Well there's no paperwork required, where is the paperwork?*"– Ryan

Four participants describe people travelling out of town to visit multiple doctors in different towns to try and obtain fentanyl. For example:

"*In some areas they go round small towns and if they haven't got enough paperwork and so they let them have a box and give them a box or something... and telling lies and that and just – I heard people trying – like every couple of days they get six or seven boxes and that at a time*" – Paul

"I know that people travel out of town to see doctors who will prescribe it. They'll sit in the emergency rooms for ages and try and prove how they're prescribed fentanyl but they haven't got any, they've lost their box or whatever." – Diane

One participant stated that their region was "*ripe*" for doctor shopping about four or five years ago but that tracking systems and doctor education had made prescription opiates harder to get. Five participants from the same regional area discussed how doctors were aware of fentanyl misuse. The region had a campaign by health workers to warn drug users and doctors of the risks associated with fentanyl and media reports on the harms associated with fentanyl use because of overdose deaths. The campaign was described as having an impact on fentanyl availability. For example:

"It's known on the street that you can't walk into a doctor's surgery and ask for one, they'll be on the phone straight away to Drugs and Poisons... the second you say the word OxyContin or fentanyl here the doctor's face changes completely... they won't to have anything to do with it….so I know there is a big crackdown in {town}, Like just the word fentanyl, and it's in our local paper so much, but just the word in a doctor's room will just about almost have you kicked out." - Diane

Two participants stated they believed doctors had originally thought prescribing fentanyl was preferable to oxycodone as it was more difficult to inject:

"*Well for some reason or other doctors think that by giving you fentanyl and taking you off OxyContin they're doing you favours when they're actually doing you harm."* – Richard

Cost of fentanyl

The cost of the drug was reasonably consistent across the areas participants were drawn from. A quarter of a patch was typically sold for $50 and most study participants said they would buy a half or $100 worth. Rapidly increasing tolerance meant the cost of use also increased bringing associated problems.

For example;

Since the fentanyl come out I've been sharing needles all the time, just because if I don't have money and I need that hit, or if I do have money and I can't get that fentanyl I would use someone else's spoon

	Mean	Range
Age at time of interview	35	24 - 55
Age when first used opioids	17	14 - 23
# of years since first use of opioids	15	6 - 23
# of years since first using fentanyl	4	1 - 5

Table 2: Participants injecting drug use history.

they've double dipped in, or I would even use their dirty needles, that's how strong the hold is that it has on you. – Jarrad

"Now it's got to where I need a patch a day, so I spend her money [partner], and then I spend all my money and then I spend all her money."- Troy

Preparing and using fentanyl

Fentanyl has to be extracted from the patch to be injected. All participants stated they had used vinegar as an extraction substance. All participants also said that lemon juice could be used, however preferred vinegar. Participants described boiling/simmering the patch with the extraction substance. Only one participant stated she had seen others use alcohol as an extraction substance.

"I was just told how to use... vinegar or the higher alkalines, so alcohol, the more potent – so Vodka or anything like that... because it draws it out quicker... the alcohol is stronger so it draws more out. Yeah, so straight Vodka" – Tammy

Most participants stated the role of vinegar was to extract the fentanyl from the patch;

"It extracts the fentanyl or something out of the patch." – Susan

One participant stated that he did not know what the role of the vinegar was and another said that he was not sure if vinegar was actually needed to extract fentanyl. However they both continued to use vinegar in their preparations.

Many of the participants referred to acids, alkalines and PH levels in their explanations indicating some knowledge of a chemical process occurring in the extraction although typically confused acid and alkaline. When asked what they believe to be the risks involved with injecting vinegar, participants responded with a range of beliefs. These included that any risks would be low because vinegar is alkaline and similar to the body; that vinegar hardens the veins; that it can cause a build-up of bacteria; and that it interferes with the body's PH levels. For example;

"I suppose there are some risks [to injecting vinegar] somewhere but it's just a bit of alkaline acid or whatever_which you've already got in your body anyway, and I don't know whether that's justified or not, I don't know, but I don't think there is a lot of risk, no." – Jason

"Injecting vinegar? I know that it's just like your vein collapses almost instantly, and it does whack your PH out of your body and your blood and everything."-Karen

"The vinegar is still active by the time you're putting it into your veins so it's actually thickening your blood and giving you blood clots, but you don't realise that until it's either too late or by a lucky chance you get sent to a rehab or jail and actually see what yourself looks like." – Richard

Q: So you're thinking the vinegar causes vein damage?

A: *"My veins, especially five centimetres either way from my injecting site are hard, I can feel them at all times whereas I can't feel my veins on any other part of my body to be hard."*– Jarrad

Seven of the participants described re-using the patch after the initial use (up to three times). Two female participants stated that whilst they knew some people re-used the patch, they did not because they believed there was no drug remaining in it. For example;

"Q: So you would reuse the patch?

A: "*No,no point. I cook it to the best of my ability. If I was desperate I would cook it again but usually there was no result. So I think once they're cooked once they're pointless."* – Tammy

Fentanyl was described as a dangerous drug, unpredictable and difficult to prepare. All study participants described overdoses they had experienced or witnessed because of fentanyl use. Participant accounts of learning to use fentanyl demonstrated the importance of peer networks for disseminating information about drugs and methods of use. For example;

"They just said, "This is how you do it," and I just done it myself... That's all I've heard, yeah. Yeah, that's all, and these guys have been on it the whole time, so no one has ever told me any different." – Lee

Q: Have you ever looked on the internet or anything like that about it?

A: "*I did once, and there were so many different sorts of fentanyl patches or different ways that they were saying to draw it out, but I just went with what knew*." - Tammy

There were a wide range of beliefs about how fentanyl was contained in the patch and how it was best extracted. The underlined words are erroneous beliefs about fentanyl patches;

Q: You said that other people are preparing fentanyl wrong. What do you mean?

A: *"Well they get something, usually say like a knife, and scratch the glue off the bottom of the patch, and think that that's where the Morphine is. Well it's actually in between the sticky stuff and the front of the patch. I could make the deadliest shot and then just pull the thing out and stick it to the fridge with all the sticky stuff still back on it on the back."* – Karen

"Well there was a bit of a misunderstanding with it. Everyone thought that the patch could just be cut up and sold off as little bits, but I think there's only one little area that's actually got the drug in it. I'm not sure but, some people were getting sold parts of the patch that weren't doing anything, and yeah, some guys figured out that it was only in one little area, so yeah, you just cut off what you need or if you mix up the whole thing just put it in" – Liam

"Yeah, and sometimes if you put punch holes in the quarter it brings the morphine out a bit more." Paul

"And people don't know with some of it, you know, they don't read the label and that on it, and if you're only used to having small dosages and if you bend that patch it will automatically let's all of it release." – Richard

"You have to let it bubble because the bubbles are really the one thing that draw the Fentanyl out of the patch, but you have to keep pressure on the top of it." – Karen

"Because when you're cooking it on the stove you lose a lot in evaporation, a lot of the liquid, and some people have different points of view, and some people say the Opiates can't evaporate, only the liquid does, like the actual water in it. Other people don't like losing much in

steam…. It's so hard to explain, it just evaporates in the air." – Diane

Benefits

Participants were asked what they liked about fentanyl. Most found this difficult to answer. Only one participant described seeking fentanyl because he had been attempting to get stoned whilst on methadone:

"The first time I used it – well because I'm on a 100ml of Methadone, if you have "Oxies" or anything like that you need more and more, and the first time I had fentanyl I actually got really, really stoned, so it was a good feeling that something had finally been able to make me stoned while on the Methadone, and it had that clean Heroin type of taste down my throat and all that, so yeah it was a good feeling." – Jason

Availability of a drug that would stop their cravings for some type of opioid product was most often described rather than a preference for fentanyl

"Yeah, there were no OxyContins around, and my friend said that he can get patches and they're better than OxyContins and so he mixed it up, and yeah." – Susan

"I jumped off the Methadone Program and I shouldn't have, and I needed something to take the edge off and that was there so I tried it" – Tammy

When discussing reasons for using fentanyl, most participants described severe physical and psychological dependence on opioids as the key driving factor in selecting fentanyl. These reasons were closely aligned with an increased tolerance to opioids and the strength of fentanyl:

"Opiate users are desperate, they're going to – and desperate human beings go to desperate measures to seek what they desperately need." – Diane

"If I get really depressed I'll go and get Duragesic fentanyl, and I break it down and I know what it's going to do but it's the only thing that, to me now, because I've got quite a high tolerance and what not, that I can break down and that I can actually feel... That's a long way to drive just to – that's an hour and a half there and an hour and a half back, that's three hours out of your day spent trying to feel normal." – Karen

Whilst some participants disliked the idea of using fentanyl, in instances where their preferred opioid was not available, dependence meant that participants perceived no choice than to use fentanyl:

"I had a very high tolerance and I used a large amount of Heroin and so did my ex-partner... and we found that... when we were having a weak moment we would find in [town] there was really only Morphine, like OxyContin and that kind of thing, and fentanyl patches, but there was only one or two Heroin dealers, and they were known to be rip offs.... we sort of pretty much stayed away from it in the end unless we were absolutely desperate." – Diane

"I didn't want to go to near it because you would have to administer it, like you cook it up and then mix it up, but when I couldn't get anything that was the last resort... I went to a friend's house and that's all they had, and I was hanging out so I didn't question anything, he just cut me off half a one" – Lee

The strength of fentanyl posed a catch 22 for many participants. Several participants cited the strength of fentanyl as a highly attractive feature, particularly because of their higher levels of tolerance;

"Once people go to fentanyl, they make that change, they can't go back because they just want stronger, stronger, stronger, and so fentanyl is the strongest. They can't go back, you know, the Oxies are shit." – Liam

Some of the participants described the perceived cleanliness and quality of fentanyl as a benefit:

"If it wasn't so potent it would be good to inject because it's clean, it's clear, there's no chalk in it, it's a clean type of stuff that comes out of the patch that you inject... Like I said it's just so clean and it comes out a clear liquid, there's no chalk and crap in it, it's like injecting water." – Jason

"I wouldn't say I've had high grade Heroin because by the time it gets to me or whatever, it's always been that cut that it's low grade Heroin... Most people I know who have ever been addicted to a downer would rather use pharmaceutical drugs which the government makes. Yeah. Probably because they know it's safer, as well in ways." Jarrad

Harms

Participants described a number of harms they or others had experienced as a result of fentanyl use. All twelve participants state that they no longer engage in social and/or recreational activities:

"What type of social or recreational type things do you do?

"Not much. I used to go to the gym but once I started using heaps again I didn't go anymore." – Lee

Physical health problems:

"You can really hurt yourself, hurts your arm. And, body wise, I got a – what do you call it? A cyst kind of thing, an abscess. I ended up going to a hospital and cutting them out about six times. I felt real ashamed about it, you know, "What am I doing to myself? just these big hole in my arms." – Paul

Family problems:

"But it became almost routine, like having a cigarette, that I would be using this horrible, horrible drug that was taking my time away from my children, it was taking my finances away from my children, and honestly they are my life." – Karen

Financial problems:

"but now it's got to where I need a patch a day, so that's $100 a day. So if it hadn't been for my partner and that I wouldn't be able to afford that, but we're sick of going around in circles, so we just end up with nothing so that's what brought me here." – Troy

Legal concerns:

"I had to go up to hospital [to get clean syringes] and sometimes the police pull us over... They [other users] would rather chuck them away in a bin or somewhere in a park or down the river, rather than keep it in their pocket… get strip searched probably five times a week... in front of everyone, just to let them know we're users. It's pretty hard, and even harder to try and get a job when they're going around and doing it in front of everyone, you know, even up town." – Paul

Dependence:

"It takes all your dignity away, you've got no dignity left. You'll rob anyone for a fentanyl shot. It's one of the worst drugs that I've ever come across, put it that way, and I've used a lot of drugs in my time and that there is just by far the worst drug, and it's a drug where you don't see it in yourself, it takes control of your mind and everything. It's one of the

worst things – I'm telling you man, it's like – it is – it is one of the worst things I've ever come across." – Richard

Dependence was described as a precursor to risk-taking and participants considered this to be an unfavourable outcome of their using behaviours:

"Since the fentanyl come out I've been sharing needles all the time, just because if I don't have money and I need that hit, or if I do have money and I can't get that fentanyl I would use someone else's spoon they've double dipped in, or I would even use their dirty needles, that's how strong the hold is that it has on you." – Jarrad

"The risk that you take is unbelievable in the end, to get that high that you're probably never – that is very dangerous to get, I guess, for the amounts that you're going to have to use in the long run and what you're going to do to do it." – Lee

Tolerance to fentanyl and needing to use increasing amounts was described as a problem

"Fentanyl is a different drug, it's a Morphine, and when you're hanging out for it it's so bad it's indescribable, it's the worst thing I've ever had. I've injected drugs for 11 years, or maybe I haven't been as bad as I have been over the past two years on them, but I've never ever felt such an addiction to any other drug other than Fentanyl." – Jarrad

"You can judge it but it's whether your tolerance is up to it. It's a number of things, whether you've got anything in you, a Valium or Serapax or something like that that can contribute to doubling the strength of it or whatever. Well let's face it a lot of deaths have been caused through mixing stupid Benzos and things like that" – Ryan

All participants discussed overdose at length. Many of the participants had overdosed from ***fentanyl*** or have seen someone else overdose. All of the participants knew of someone who had died from a ***fentanyl*** overdose:

"Q: So how many people do you reckon you've seen overdose?

A: "*Well I know I've seen three or maybe four people in the last 12 or so months, one person twice. I actually had one mate die at just at Christmas time. That was my best mate."* – Jason

"I've never seen anyone drop off drugs before or die except for fentanyl, and I started seeing it quite regularly." – Jarrad

"**Q: How many people do you reckon you've known have died from using the patches?**

A: *"My missus, two cousins... about five of them."* Paul

Two participants described fentanyl users' warning inexperienced opiate users not to use fentanyl. For example:

"I can't see first time users going straight to fentanyl because the drug users that they're getting it from they will say, "No, no." They would definitely steer them clear of that... long term users, people who can handle will, they're the ones that are using it, they're the ones that are overdosing." – Lee

Discussion

The key finding was participants' lack of knowledge of the drug they were using including what it was; how to extract it and how to measure the dose. This study reinforces the peer network as the key source of information in drug using practices. However, the information shared is poor, even dangerous. Participants in this study were basing their preparatory techniques and other health beliefs on half-truths, mistruths and some speculation. This lack of knowledge, coupled with a mechanism of peer-to-peer information sharing indicates that erroneous health knowledge can be perpetuated by peer networks.

The study participants' beliefs about the where the drug was located in the patch and how to best extract it give some insight into why overdose deaths occur. The amounts of fentanyl in a preparation will vary according to what the person preparing the injection believes. A 100mg fentanyl patch is the equivalent of 1680 milligrams of morphine or 14, 80 milligram Oxycontin tablets (Latimer, 2014 pers corres.). However, some participants said they would use a whole patch in one preparation. Further, fentanyl is distributed evenly through the patch within the adhesive [30], not located in one part of the patch. Fentanyl patches do not need to be heated when an acid is applied to extract the drug from the adhesive [31]. Vinegar and lemon juice are extremely high acidity substances that will cause vein damage when injected and other lower acidity options are available [32,33].

Study participants expressed concern about harms they experienced and were aware of the risks of overdose and death from using fentanyl. However, they were not aware of how their erroneous beliefs about how to prepare and use the drug were putting them at risk. Rather when discussing overdose they rationalised any deaths as inexperience or lack of knowledge of the user. Whereas they believed they were personally protected from that by their particular preparation and injecting practices. It is likely the participants of this study would not seek out harm reduction information because they were experienced injecting drug users who perceived they did not need advice.

Harm reduction strategies are predicated on the belief that the drug user has their own best interests at heart and they are an active participant in gaining knowledge to use more safely [22]. While this may be generally true, it could also pose problems when it is not the case. Harm reduction practitioners may assume that drug users actively seek out information and are better informed than they actually are. If the onus is on the drug user to identify safer methods then the harm reduction practitioners will wait for people to come to them rather than finding people who need information. Resources for harm reduction are already scarce in rural Australia [18,19]. Ways to spread harm reduction information and support into isolated small towns where injecting drug use is prevalent are required.

The concept of peer-to-peer education in harm minimization is an empowering, efficacious and cost-effective means to reach individuals who would perhaps not come into contact with health professionals [25, 34]. It is evident from these findings that a peer-to-peer framework of information dissemination would provide a logical and effective method of distributing correct information and harm minimisation messages particularly in rural areas where formal information via written or internet sources was not accessed and treatment options are limited [18,19].

General Practitioners are also likely to be lacking information about fentanyl misuse. Ultimately fentanyl comes from doctors. Any harm reduction strategy must include information for doctors about illicit fentanyl use. Critical to this approach is emphasising the strong hold opiates have over their users as described in the study participant's accounts; and ways dependence can be addressed via medical and psycho-social treatment rather than a punitive approach [24].

The findings from this study are exploratory and therefore limited in generalisability. A qualitative investigation exploring an under-researched topic is valuable to gain insight into the specific

experiences of participants. However a larger study is warranted. It is not clear how much the rural location influenced the participant's fentanyl experiences or use because they were not compared with people injecting fentanyl who lived in urban locations. However, it is important to note that fentanyl was easily obtained in rural areas and potentially more available than other opioids. Further, all the study participants had some contact with drug treatment agencies as that is how they were recruited for the study. People using fentanyl who were not in contact with treatment providers may have different views and experiences of using fentanyl.

Training and resourcing rural injecting drug users to pass on better information about using fentanyl is a challenging strategy but one likely to be successful if the user groups can be infiltrated effectively. In rural areas the user groups are small and some of them do come into contact with treatment providers. If those providers can pass on good harm reduction information about fentanyl it may reduce overdose deaths. Developing and disseminating the good harm reduction information is the next challenge.

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