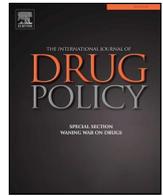




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Research Paper

The association between experiencing discrimination and physical and mental health among people who inject drugs

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ABSTRACT

Background: Discrimination can be a daily issue in the lives of people who inject drugs (PWID). However, the extent to which discrimination is related to the health of PWID remains unclear.

Methods: Data focusing on discrimination against PWID and potential health correlates were collected as part of the 2013 Illicit Drug Reporting System, a national survey with 887 PWID recruited in all Australian states and territories. Experience of discrimination, its setting, perceived reason and outcome, were self-reported by participants. The Kessler-10 scale and the mental component score of the Short Form 12-Item Health Survey were used to measure mental health. Physical health was assessed using the physical component score of the Short Form 12-Item Health Survey, specifically questions assessing injecting related problems and risk behaviour. Poisson and multinomial regression analyses were performed. Models were adjusted for socio-demographic and drug-related covariates.

Findings: PWID reported experiencing discrimination in pharmacies, hospitals, government services and doctors/prescribers. The most commonly reported instances of discrimination were being refused service and experiencing abuse and/or violence. Experience of discrimination was associated with mental and physical health indicators. PWID who experienced discrimination were more likely to report high or very high mental distress (ARRR = 2.4, CI₉₅ = 1.5–3.6) and mental health problems (ARRR = 1.4, CI₉₅ = 1.2–1.7). The mental functioning (ARRR = 1.3, CI₉₅ = 1.1–1.4) and physical functioning (ARRR = 1.1, CI₉₅ = 1.1–1.4) of PWID, who experienced discrimination, were also more likely to be below Australian population mean scores.

Conclusion: Self-reported experience of discrimination was associated with poor mental and physical health amongst PWID.

Background

Globally, it is estimated that around 12 million people inject drugs (United Nations Office on Drugs and Crime (UNDOC) (2017)) and injecting drug use has been reported in 148 countries (United Nations Office on Drugs and Crime (UNDOC) (2009)). Previous studies have reported that the quality of life (QOL) of people who inject drugs (PWID) (Fischer, Conrad, Clavarino, Kemp, & Najman, 2013), as well as their mental and physical health levels are poorer than those of the general Australian population (Stafford, 2015). Injecting drug use is a highly stigmatized behaviour (Ahern, Stuber, & Galea, 2007) towards which the general community, and even those who use drugs but do not inject, tend to be extremely critical (Ahern et al., 2007).

Discrimination is defined as actions from a person or a group that aims to harm another (Huddy, Sears, Levy, Al Ramiah, & Hewstone,

2013). With regards to PWID, discriminatory behaviour is one important issue that may generate social and individual adverse outcomes in those discriminated against (Sartorius, 2006). In this way the experience of discrimination may be a factor contributing to poor health amongst PWID, since reduced community empathy, the consequent discriminatory behaviour, and the resulting marginalisation (Goffman, 1986) may adversely impact their mental and physical wellbeing. This is seen in other stigmatised groups such as racial minorities (Nadimpalli & Hutchinson, 2012), sexual minorities, people living with HIV/AIDS (Bogart, Landrine, Galvan, Wagner, & Klein, 2013), and those with an intellectual disability (Stuart, 2012). A review of forty-nine studies of stigmatised groups other than PWID, found that discrimination was associated with poorer mental health than the general population (Mak, Poon, Pun, & Cheung, 2007b). Another review of fourteen studies also found that discrimination was positively correlated with depressive

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symptoms, as well as with greater prevalence of physical health problems such as cardiovascular disease and respiratory conditions (Nadimpalli & Hutchinson, 2012).

Findings from an Australian report suggest that discrimination is felt by PWID on a daily basis (Australian Injecting and Illicit Drug Users League (AIVL) (2011)). Discrimination against PWID may be due to the act of injecting drugs or its association with blood borne viruses (i.e. HIV and Hepatitis C) (Stafford & Burns, 2014), the negative connotations attached to injecting drug use as well as the low socio-economic position of many PWID (Couto e Cruz, Salom, Maravilla, & Alati, 2018). The nature of the relationship between discrimination and the health of PWID remains unclear (Rivera, DeCuir, Crawford, Amesty, & Lewis, 2014; Robinson, 2006). It is also unclear how being discriminated against by professionals such as health service personnel may actively affect the health of PWID. Previous research has shown that people tend to avoid places where they have experienced discrimination (Pachankis, 2007). For PWID, discrimination in health care settings can lead to avoidance of services which they may otherwise attend. This, in turn, may lead to increased health risks and harms to health and wellbeing through avoidance of these services (Sarin, Samson, & Sweat, 2013; Wilson, Brener, Mao, & Treloar, 2014). In the longer term, this may lead to increased use of emergency rather than primary health care services, placing unnecessary burden on the health system.

Apart from discrimination by health workers, a recently published systematic review identified general community, media, government and even peers as perpetrators of discrimination against PWID (Couto e Cruz et al., 2018). A meta-analytic review pooling 134 studies concluded that discrimination is significantly associated with mental and physical health outcomes. The study suggested that high stress and health behaviours may be in the pathway between discrimination and health, even when controlling for socio-demographic variables, whereas social support, coping style and group identification can be protective (Pascoe & Richman, 2009).

To date, the existing literature on discrimination against PWID and health outcomes is scant (Bullen, 2010; Rivera et al., 2014). In the Australian context, a study of 265 PWID, suggested a link between discrimination and mental and physical health problems (Australian Injecting and Illicit Drug Users League (AIVL) (2015)). However, despite a reasonable sample size ($n = 265$), no quantitative analyses were undertaken and no details were provided about the methodology used to approach the issue of discrimination. Thus, there is a need for studies which can better investigate the specific physical and mental health correlates of discrimination, and identify the settings in which PWID most frequently experience discrimination.

In this study we examined the relationship between experiences of discrimination against PWID in their lifetime and health status across a range of health indicators and drug-related harms. We used a large and diverse sample drawn from multiple locations across Australia. In so doing, we aim to identify both specific health problems linked to discrimination and locations in which discrimination could be reduced by affirmative action.

Methodology

Study design

This study used data from the Illicit Drug Reporting System (IDRS), which is an Australian study that has monitored drug trends among Australian PWID since 2000 (Sutherland et al., 2015). The IDRS is a national study conducted in the capital cities of all eight states or territories in Australia, sampling approximately 900 PWID per year. Part of the IDRS involves an annual quantitative cross-sectional study. The methodology of IDRS is extensively described elsewhere (Hando, Darke, O'Brien, Maher, & Hall, 1998). During face-to-face interviews, participants provide information about their patterns of drug use, health and wellbeing, use of health services and recent involvement in crime.

Participants are reimbursed forty Australian dollars for their time and out-of-pocket expenses. Ethics approval for the IDRS was obtained locally from the appropriate Ethics Committee in each city as well as from the University of New South Wales Human Research Ethics Committee (Horyniak et al., 2013) and participants provided either verbal or written informed consent.

Recruitment of study participants and data collection methods

Since PWID are a hidden population, random population sampling is not feasible, therefore, alternative sampling procedures have been used to recruit the IDRS sample (Thompson & Collins, 2002). The IDRS sampling process is non-randomised, health service based supplemented by peer referral (Horyniak et al., 2013). Eligible participants were aged seventeen years and over, reported injecting drugs regularly for at least the last six months, and had resided in the city of interview for at least one year prior to interview (Sutherland et al., 2015).

Measures

Discrimination was assessed using a module of the IDRS 2013 questionnaire, with items enquiring if participants had ever been discriminated against as a result of their injecting drug use, Hepatitis C/HIV status, and/or being on Methadone or Buprenorphine. The response options assessed the timeframe of discrimination (No/ Yes, not in the last 12 months/Yes, within the last 12 months). The following questions assessed the location of discrimination by asking PWID 'where did the discrimination take place' (Doctor or Prescriber/ Pharmacy/ Dentist, Health Services (e.g. mental/youth or community)/ Government Service (e.g. housing or centrelink)/ Police, Hospital, Needle and Syringe Program, Drug and Alcohol Service/ Prison/ Other). In this specific item, due to the vast reporting of "other" as a response, the categories of locations of discrimination "public places/general public", "friends, family or at home" and "work or attempting to find a job" were added to the analysis. Perceived reason for discrimination was assessed through one item asking PWID 'why do you think you were discriminated against?' (Because I'm an injecting drug user (or people think I am)/ Because I'm on Methadone/Subutex/Suboxone (or people think I am)/ Because I have Hepatitis C (or people think I have Hep C)/ Because I have HIV (or people think I have HIV)/ Other). Another item in the discrimination module also assessed 'if anything happened as a result of the discrimination' (No/ Refused service/ Taken off (or reduce Methadone/Subutex/Suboxone)/ You were 'outed' as a drug user/ Violence or abuse towards you/ Lost your job/ Other) and if 'PWID tried to resolve the discrimination by making a formal complaint' (No/ Australian Human Rights Commission, Health Care Complaint Commission (in your State/Territory)/Directly to the service provider/Organisation involved/ Other).

The outcome variables of interest were divided into general, mental and drug related-physical health indicators. General health was measured with a five point Likert scale which asked how the participants perceived their health in general; this was dichotomised into good-excellent or fair/poor. Three mental health indicators were used: a single question about self-reported mental health problems (no/yes); the Kessler-10 scale (K-10) (Kessler et al., 2002); and the mental component score (MCS) of the Short Form 12-Item Health Survey (SF-12) scale (Ware, Kosinski, & Keller, 1996). The cut-off points used for K-10 were 10–15 for "low or no distress", 16–21 for "moderate distress" and 22–50 for "high or very high distress" (Stafford & Burns, 2014). We used the Australian population mean score (49.8) as the cut-off point to dichotomise MCS into "below population mean" and "equal or above population mean". The SF-12 also measures physical health through the physical component score (PCS). We again used the Australian population mean score (50.1) as the cut-off point to dichotomise PCS outcome values as "equal to or above" and "below" (Stafford & Burns, 2014). Injection-related risks and harms were assessed through binary

variables about experiences of overdose in the participants' lifetime (no/yes) and any injecting-related problems (dirty hit,¹ prominent scarring or bruising, or difficulty injecting) (no/yes) as well as injecting risk behaviour (borrowing needles) (no/yes) in the month prior to the interview.

Covariates

Covariates retained in the models were significantly associated with at least one dependent or independent variable (Supplementary Table 1). All models were adjusted for the same covariates. Socio-demographic covariates examined were age, Aboriginal or Torres Strait Island descent, gender, education level, sexual identity, employment status and main source of income. These factors have been associated with mental and physical health (Kessler et al., 1994; Morrell et al., 2013; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2006; Teesson, Slade, & Mills, 2009). All were dichotomised for clarity. Drug-related covariates examined have previously been found to be significantly associated with discrimination and health indicators in the IDRS data (Betts et al., 2015; Sutherland et al., 2016). These were categorised as follows: drug injected most often (heroin/ opiate substitution therapy or other opiates/stimulants) and frequency of injection (weekly or less/more than weekly but not daily/daily or more). Age of first injection was recoded into five categories (0–14 years/15–18 years/19–25 years/26–35 years/36 or older). Treatment status was dichotomised (no/yes). Observations were excluded from the analysis where variables could not be recoded into these categories.

Data analysis and covariates

We used chi-squared analyses to assess the covariates listed as potential confounders in the relationships between discrimination and health indicators. We then performed Poisson regression analyses for all models except for the one assessing mental distress as an outcome (Kessler-10), for which we used multinomial regression analyses. All models were adjusted for all covariates significantly associated ($p < 0.05$) with either discrimination or health indicators. Missing data represented 5% of the original sample. In sensitivity analysis, where we compared those missing with those retained, we found no significant differences between the two groups (data not shown). All analyses were undertaken using Stata 14 (StataCorp, 2015).

Findings

The total sample of IDRS 2013 was 887, but our study only considered participants who provided information about experience of discrimination ($N = 790$). Nearly two-thirds of included participants (63%) reported having experienced discrimination during their lifetime. The majority of those ($n = 500$) were male (59%), heterosexual (88%) and had a mean age of forty years. Most were unemployed (85%), and reported a government pension, allowance or benefit (89%) as their main source of income (Table 1). The majority of those who reported ever experiencing discrimination had a history of imprisonment (58%), injected drugs relatively frequently (weekly, 38%, or daily, 41%), injected opioids most of the time (74%) and were undergoing some form of drug-related treatment (53%) at the time of the interview. The majority of the participants who experienced discrimination in the previous twelve months perceived that discrimination had occurred because they were PWID (79%).

Age, gender, sexual identity, Aboriginal or Torres Strait Island descent, education level, employment, age of initiation, drug most often injected and treatment status varied significantly ($p < 0.05$) with either experience of discrimination (Table 1) or the health indicators and

Table 1
Socio-demographic and drug-related characteristics of participants ($n = 790$), by lifetime experience of discrimination.

Variables	Experienced Discrimination		P-value
	No (%)	Yes (%)	
Gender (n = 786)	n = 289	n = 497	0.000
Female	26.3	41.1	
Male	73.7	59.0	
Age (n = 790)	n = 290	n = 500	0.042
Younger than 40 years	56.9	49.4	
40 years and older	43.1	50.6	
Sexual Identity (n = 790)	n = 290	n = 500	0.086
Heterosexual	91.7	87.8	
Non-heterosexual	8.3	12.2	
Aboriginal/Torres Strait Islander (n = 790)	n = 290	n = 500	0.794
No	82.1	82.8	
Yes	17.9	17.2	
Education Level (n = 790)	n = 290	n = 500	0.098
Year 10 or less	38.6	32.8	
Years 11 and 12	61.4	67.2	
Employment status (n = 790)	n = 288	n = 493	0.068
Not employed	90.3	85.8	
Work and/or study	9.7	14.2	
Main source of income (n = 788)	n = 289	n = 499	0.551
Wage or salary	6.7	6.7	
Government pension/allowance or benefit	91.6	90.3	
Criminal activity/Sex work	1.8	3.0	
Currently in Treatment (n = 790)	n = 290	n = 500	0.000
Not in treatment	64.8	47.2	
In treatment	35.2	52.8	
Age first injected (n = 789)	n = 289	n = 500	0.008
14 years or younger	13.8	14.0	
15–18 years	35.6	45.0	
19–25 years	31.1	28.0	
26–35 years	14.5	11.6	
36 years or older	4.8	1.4	
Drug injected most often (n = 768)	n = 283	n = 485	0.007
Heroin	35.3	47.0	
OST ^a /other opiates	33.9	27.2	
Stimulants	30.7	25.8	
Frequency of Injecting (n = 788)	n = 289	n = 499	0.843
Weekly or less	21.8	21.0	
More than weekly, not daily	36.0	38.1	
Daily or more	42.2	40.9	

^a Medication provided on Opioid Substitution Therapy.

so were used to adjust all multivariable models.

Self-reported mental health problems, psychological distress, mental and physical functioning were all significantly correlated with experience of discrimination in bivariate analyses (Table 2).

Locations and reported results of discrimination

Information on location and reported results of discrimination was only available for PWID who reported having experienced discrimination in the previous 12 months, which represents nearly half of the total sample (47%). For PWID who reported having experienced discrimination in the preceding 12 months ($n = 372$), the most frequently reported locations of discrimination were pharmacies (26%), police (24%), doctors/prescribers (22%), hospitals (21%), public location/members of the public (21%), government services (14%) and home/friends and family (12%) (Table 3). The most frequently reported results of experiencing discrimination were being refused service (18%) and experiencing violence/abuse (18%). Very few (12%) participants who reported having experienced discrimination in the preceding 12

¹ An injection that makes the person feel sick.

Table 2
Health status of participants, by lifetime experience of discrimination (n = 790).

Variables	Experienced Discrimination		P-value
	No (%)	Yes (%)	
Self-reported general health (n = 778)	n = 285	n = 493	0.160
Fair or poor	57.5	52.3	
Good to excellent	42.5	47.7	
Ever experienced overdose (n = 790)	n = 290	n = 500	0.000
No	38.3	26.4	
Yes	61.7	73.6	
Experienced dirty hit^c (n = 789)^a	n = 290	n = 499	0.117
No	91.4	87.8	
Yes	8.6	12.2	
Had prominent scarring or bruising (n = 769)^a	n = 284	n = 485	0.000
No	67.6	54.0	
Yes	32.4	46.0	
Had difficulty injecting (n = 769)^a	n = 284	n = 485	0.007
No	71.1	61.4	
Yes	28.9	38.6	
Borrowed needles (n = 785)^a	n = 289	n = 496	0.799
No	93.1	93.6	
Yes	6.9	6.5	
Physical functioning (SF-12) (n = 774)^a	n = 285	n = 489	0.000
Equal to or above Australia population mean	42.1	23.3	
Below Australia population mean	57.9	76.7	
Mental functioning (SF-12) (n = 774)^a	n = 285	n = 489	0.000
Equal to or above Australia population mean	42.1	23.7	
Below Australia population mean	57.9	76.3	
Self-reported mental health problems (n = 773)^b	n = 283	n = 490	0.000
No	63.6	47.1	
Yes	36.4	52.9	
Recent mental distress (Kessler 10) (n = 781)^a	n = 286	n = 495	0.000
Low or no distress	27.3	15.0	
Moderate distress	26.2	24.4	
High or very high distress	46.5	60.6	

^a Previous month.

^b Previous six months.

^c Injection that makes the person feel sick.

months reported having tried to resolve the discrimination.

Associations between discrimination and health

As the results of our sensitivity analysis (Supplementary Table 2) did not show significant differences between timeframes of discrimination, we generated a variable combining responses of those who reported experiencing discrimination in their lifetime (both within the previous 12 months and prior to that) and performed the analysis of our final model (Table 4). We also intended to investigate distinctions between different forms of discrimination (i.e. due to injecting drug use, opioid substitution treatment or having a blood borne virus infection). However, as the perceived reason for discrimination was overwhelmingly due to injecting drug use (Table 3), the small cell size for other options precluded further analysis.

Discrimination against PWID was associated with poorer mental health indicators and physical functioning (Table 4). As measured by the SF-12, the physical functioning of PWID who experienced discrimination was more likely [Adjusted Relative Risk Ratio (ARRR) = 1.3, 95% Confidence Interval (CI₉₅) = 1.1–1.4] to be below the Australian population mean score compared with PWID who did not experience discrimination. Mental health issues were also associated with

Table 3

Location, reasons report and results of discrimination experienced by people who inject drugs in the previous twelve months (n = 372).

	%
Location of discrimination	
Doctor/Prescriber	22.0
Pharmacy	26.1
Dentist	3.0
Health Services (e.g. mental/youth or community)	9.7
Government Service (e.g. housing or Centrelink)	14.0
Police	23.7
Hospital	21.2
Needle and Syringe Program	1.9
Drug and Alcohol Service	5.4
Prison	4.3
Public places/General Public	21.0
Friends, family or at home	11.8
Work or attempting to find a job	5.7
Reasons for discrimination	
Person who injects drugs	79.3
On OST medication	18.6
HCV Positive	10.0
HIV Positive	0.8
Other	14.0
Results of discrimination	
Refused service	17.5
Taken off/ reduced OST medication	1.9
"Outed" as a person who uses drugs	10.5
Experienced violence/abuse	18.0
Lost job	4.0
Other	48.9
Tried to resolve discrimination	
Didn't try to resolve	89.0
Australian human rights commission	0.5
Health care complaint commission ^a	0.5
Directly to service provider/organisation	6.2
Other	4.3

^a Replaced by the Office of the Health Ombudsman in 2014.

discrimination. PWID who reported being discriminated against were more likely to experience moderate mental distress (ARRR = 1.8, CI₉₅ = 1.1–2.8) and high or very high distress (ARRR = 2.4, CI₉₅ = 1.5–3.6), according to the Kessler-10 scale. They were also more likely to self-report mental health problems (ARRR = 1.4, CI₉₅ = 1.2–1.7). The mental functioning of PWID who experienced discrimination, as measured by the SF-12, was more likely to be below the Australian population mean score than those PWID who did not experience discrimination (ARRR = 1.3, CI₉₅ = 1.1–1.4).

Discussion

Our findings suggest that experience of discrimination was significantly related to poorer scores on a range of mental and physical health indicators after adjustment for possible covariates. Experience of discrimination was associated with poor mental health indicators, and physical functioning scores of PWID, who experienced discrimination, were more likely to be below the Australian population mean. These findings are in line with previous research with marginalised populations (Mak, Poon, Pun, & Cheung, 2007a; Nadimpalli & Hutchinson, 2012) that have found links between discrimination and poorer mental and physical health (Couto e Cruz et al., 2018). Our findings add to the existing literature by providing detailed analysis of the contexts of discrimination, perceived reasons, results and attempts to resolve it. More importantly, we used validated scales to measure links between discrimination and health in a large national sample of nearly eight hundred PWID.

In our study, discrimination was linked with poor physical functioning, as measured by the SF-12. The construct measures daily activities as well as the notion of accomplishment in relation to how

Table 4
Adjusted relationships between lifetime experience of discrimination and indicators of health or harm.^a

	General health	Physical functioning (SF-12)	Injection related health harms		Injecting risk behaviour	Mental functioning (SF-12)	Mental health problems	Mental distress (Kessler 10)	
	Poor/fair	Below Australian mean	Overdose ^c	Injection-related problems ^b	Borrow needles ^d	Below Australian mean	Any mental health problem ^e	Mod. distress ^d	High or very high distress ^d
	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅	ARRR CI ₉₅
Discrimination	1.2	1.3 ^{***}	1.2 ^{**}	1.0	1.0	1.3 ^{***}	1.4 ^{***}	1.8 [*]	2.4 ^{***}
<i>Male</i>	1.0-1.4	1.1-1.4	1.0-1.3	0.9-1.0	0.5-1.7	1.1-1.4	1.2-1.7	1.1-2.8	1.5-3.6
<i>Younger than 40 YO</i>	–	0.9 ^{**}	–	–	–	0.9 ^{**}	0.8 ^{**}	–	–
<i>40+ YO</i>	–	0.8-1.0	–	–	–	0.8-0.9	0.7-0.9	–	–
<i>Non-Heterosexual</i>	–	–	–	–	–	–	–	0.5 ^{**}	–
<i>Aboriginal/Torres Strait Islander</i>	–	0.9 ^{**}	–	–	–	0.9 ^{**}	0.8 ^{**}	0.3-0.9	–
<i>Not employed</i>	–	0.8-0.9	–	–	–	0.8-0.9	0.7-0.9	–	–
<i>OST/Other opiates^f</i>	–	–	–	–	–	–	1.3 [*]	–	–
<i>Injection more than weekly, not daily</i>	–	0.8 ^{**}	–	–	–	0.8 ^{**}	1.1-1.6	–	–
<i>Injection daily or more</i>	–	0.7-0.9	–	–	–	0.7-0.9	–	–	–
	–	–	–	–	–	–	–	–	2.7 ^{**}
	–	–	–	–	–	–	–	–	1.4-5.2
	–	–	–	–	0.3 ^{**}	–	–	–	–
	–	–	–	–	0.1-0.6	–	–	–	–
	1.5 ^{**}	1.2 ^{**}	–	–	–	–	–	–	–
	1.2-2.0	1.1-1.4	–	–	–	–	–	–	–
	1.5 ^{**}	–	–	–	–	–	–	–	–
	1.1-1.9	–	–	–	–	–	–	–	–

^a Columns represent separate models. All models were adjusted for age, gender, employment status, sexual identity, Aboriginal or Torres Strait Island origin, education level, most injected drug, age of first injection and if currently in treatment. Significant covariates are listed in italics.

^b Dirty hit (an injection that makes the person feel sick), prominent scarring or bruising or difficulty injecting.

^c Lifetime.

^d Previous month.

^e Previo.

^f OST/opiates other than heroin as the most injected drug us six months.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

individuals perceive their ability to perform those activities based on their physical health. In line with this, our findings might indicate unwillingness, fear, avoidance and/or poor access to health care. Previous studies have explored this issue and identified discrimination as a barrier to health. In the health care setting, PWID have been shown to wait more for treatment than other members of the public, to be treated with less courtesy by staff (Couto e Cruz et al., 2018) and to be victims of both physicians' reluctance to prescribe opioids and inadequate provision of pain medication (Brener, von Hippel, Horwitz, & Hamwood, 2015).

Discrimination against PWID was also linked to self-reported mental health problems, psychological distress and mental functioning poorer than the Australian general community. This is consistent with findings from a review of 49 studies of other stigmatised groups, where discrimination was associated with greater mental health problems (Mak et al., 2007b). We suggest that frequent experience of discrimination may lead to an intensification of personal stigma - anticipation of other people's negative attitude to oneself, which may in turn lower the self-esteem of PWID to an extent where they might perceive discriminatory acts as legitimate, as supported by a systematic review of 52 studies (Gerlinger et al., 2013). This may relate to our finding that very few participants reported having tried to resolve the discrimination they experienced. In this way, experiences of discrimination may pose an additional burden on PWID's mental health via the lowered self-esteem, and may consequently interfere with the development of positive coping skills by PWID.

Discrimination was reported to have been perpetrated by different groups and in a range of settings. Participants identified the police as a group likely to discriminate against them. This may be due to the inherent role of these professionals as having to address drug use as a matter of policing instead of public health, and to enforce legislation prohibiting possession of illicit drugs and injecting paraphernalia. This can be problematic as fear of being arrested, based on laws that prohibit possession of injecting equipment, has been linked to increased risk of injecting behaviours (Rhodes et al., 2003).

Participants reported they felt discriminated against at health care services which, as previously discussed, may also relate to our finding showing that discrimination was linked to poor physical functioning among PWID. Previous research has suggested that people tend to avoid places where they feel unwelcome (Pachankis, 2007; Treloar, Rance, & Backmund, 2013), which may lead some PWID to stop seeking health care to avoid experiencing discrimination. These PWID might be at risk of even poorer mental and physical health than the PWID in our sample, who were mostly recruited through supporting services such as Needle and Syringe Programs. The experience of discrimination in the primary care setting, and the potential for avoidance of such places by PWID, may increase demand on emergency services as a consequence. Thus, investment in training for health and law enforcement professionals to reduce discriminatory behaviours (Press, Zornberg, Geller, Carrese, & Fingerhood, 2016) may result in improvements in the health and wellbeing of PWID.

In sum, PWID in Australia are a vulnerable population with high

levels of mental health problems and poor physical health who are shown to mostly rely on a government pension for financial support (Stafford & Breen, 2017). Our findings show that discrimination may be an important barrier for improvement of mental and physical health of PWID. The development of anti-discrimination campaigns aimed at mainstream society as well as health and law enforcement professionals may improve public perceptions of PWID by increasing empathy and indirectly ameliorate PWID's standards of living, and improve their prospects of gaining employment.

This study has some limitations. Firstly, our measure of discrimination was not a validated scale, and may have limited sensitivity. Also, our study did not allow us to ascertain directionality in the relationship between discrimination and health, as data were cross-sectional. It has been shown that PWID with poorer health may be in more disadvantaged situations that then place them in social conditions subject to further discrimination (e.g. homelessness) (Neale, 2012). Therefore, it is also possible that the relationship between discrimination against PWID and health is bi-directional, where discrimination contributes to poor health and vice versa. Finally, the IDRS sample is not intended to be representative, but is a sentinel sample from whom data on drug-related trends are extracted (Sutherland et al., 2015). Despite the potential that IDRS findings may apply only to samples of high-risk regular PWID, the assumptions arising from this study should only be generalised to wider PWID populations with caution (Horyniak et al., 2013). Although the present study's way of assessing discrimination relies solely on self-report data (Sutherland et al., 2015) and may be susceptible to social desirability bias (Horyniak et al., 2013), research shows that self-reports amongst substance-using populations has been reliable (Darke, Ward, Hall, Heather, & Wodak, 1991).

This study also has advantages. The 2013 IDRS is a large sample drawn from each state and territory in Australia. We used a range of measures to investigate the mental and physical wellbeing of PWID, and we were able to account for a range of demographic and drug-related factors which may be involved in these relationships. Analyses of these data permits the identification of mental and physical health problems which are linked to experiences of discrimination. This, in turn, provides an important evidence base for policy formulation (Sutherland et al., 2015). It also helps identify areas that require further research and monitoring (Sutherland et al., 2015). Longitudinal analysis of the relationship may provide evidence of the direction of the effect of discrimination on mental and physical health of PWID.

This study shows that the experience of discrimination is linked with poor mental and physical health in a large sample of PWID from capital cities across Australia. Policies aiming to minimise discrimination towards PWID could be helpful in improving mental and physical wellbeing in this population.

Conflict of interest statement

Authors declares no conflict of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.drugpo.2018.12.010>.

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