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Police officer knowledge of and attitudes to opioid overdose and naloxone administration: an evaluation of police training in Scotland

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ABSTRACT

In the context of escalating drug-related deaths, during 2021 Police Scotland implemented a pilot project incorporating naloxone training to test the carriage and administration of naloxone by officers. The current paper presents data from the evaluation of this pilot exploring knowledge of, and attitudes to, opioid overdose and naloxone administration. Police officers completed a three-stage survey which included a modified Opioid Overdose Knowledge Scale (OOKS) and Opioid Overdose Attitudes Scales (OOAS). In total, 167 police officers completed the survey before taking part in the training; 144 completed a post-training survey; and 88 completed a follow-up survey. Training improved officers' knowledge and attitudes about drug overdose and naloxone administration. The OOKS mean total score improved from 35.8 pre-training to 37.6 at follow-up ('small-medium' effect size; Cohen's $d = 0.42$). The OOAS mean total score improved from 87.8 pre-training to 100.7 at follow-up ('large' effect size; Cohen's $d = 1.05$). Training was also reported to facilitate the acceptability of naloxone administration as part of a police officer's role. However, over a third of officers questioned the relevance of the training to their role. There was evidence that some officers held stigmatising attitudes towards people who use drugs (PWUD). Future training should address officers' knowledge of problem drug use and stigmatising attitudes towards PWUD, and train and support officers to respond to the emergent public health role of policing. The findings of this evaluation informed the decision of the Chief Constable of Police Scotland to mandate that all Police Scotland Officers routinely carry naloxone from August 2022.

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Introduction

In 2020, drug-related death (DRD) rates in Scotland were amongst the highest in Europe with 1,339 registered DRDs (National Records of Scotland (NRS) 2021). At this time, Scotland's DRD rate of 234 per million was reportedly 3.5 times higher than the UK average (NRS 2021). Opioids (heroin/morphine and/or methadone) were implicated in 89% of DRDs (NRS 2021).

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Naloxone is an emergency antidote to opioid-related overdose and works by reversing the suppression of the respiratory system. It is typically supplied to lay people in the community ('take-home' naloxone) for peer administration in injectable (intramuscular) and intranasal formulations. Intranasal naloxone has been shown to be safe compared to injectable naloxone, with no risk of needlestick injuries (Wolfe and Bernstone 2004, Kerr *et al*. 2009).

Take-home naloxone is a key part of the emergency response to prevent DRDs internationally and has been delivered in Scotland since 2011 (McAuley *et al*. 2012, WHO 2014). In response to the opioid overdose epidemic in North America, in 2010 police officers in Massachusetts were the first law enforcement officers to trial the carriage and administration of naloxone in the USA (Davis *et al*. 2014). Since then, several US police forces have made naloxone part of routine kit (Davis *et al*. 2015, Kitch and Portela 2016, Wagner *et al*. 2016, Dahlem *et al*. 2017, Heavey *et al*. 2018, Lurigio *et al*. 2018, Smyser and Lubin 2018, Jacoby *et al*. 2020, Lowder *et al*. 2020, Nath *et al*. 2020, Smiley-McDonald *et al*. 2022). Naloxone has been available to police officers in Canada since 2016 (Berardi *et al*. 2021), was piloted by police in the UK in 2019 (West Midlands Police and Crime Commissioner 2020), and more recently in Australia (West Australia Police Force 2021). The adoption of naloxone by police personifies a public health approach to policing (van Dijk *et al*. 2019, Wood and Griffin 2021).

Police officers are often the first responders to overdose incidents and are in an ideal position to save lives until paramedics arrive (White *et al*. 2021, Speakman *et al*. 2023). Evidence indicates that police officers can safely and effectively administer naloxone to people experiencing an opioid overdose (Fisher *et al*. 2016, Kitch and Portela 2016, Smyser and Lubin 2018, White *et al*. 2021, Pourtaher *et al*. 2022). Townsend *et al*. (2020) suggest that increasing the distribution of naloxone to laypeople and first responders can maximise health benefits and is a cost-effective strategic response to increasing numbers of opioid overdoses in communities. While the evidence to date is limited, police administration of naloxone has been associated with decreased opioid overdose deaths (Rando *et al*. 2015). Additionally, being equipped with naloxone can increase police officer job satisfaction (Lurigio *et al*. 2018).

Despite emerging evidence of feasibility and effectiveness, some police officers are reluctant to carry and administer naloxone (Murphy and Russell 2020, Berardi *et al*. 2021). Whilst there are a range of concerns, there are two prominent barriers to police carriage of naloxone. First, views are held that administering naloxone should be the role of paramedics and other health professionals, not police officers (Berardi *et al*. 2021, Speakman *et al*. 2023). Second, some officers are concerned about legal liability if a person suffers harm following police administration of naloxone (Speakman *et al*. 2023, Davis *et al*. 2015). This concern remains for some officers despite the provision of legal reassurances and evidence of negligible risks (Banta-Green *et al*. 2013, Willman *et al*. 2017, Jacoby *et al*. 2020, Scottish Police Authority 2022).

In March 2021, the Scottish Police Federation (SPF), the national staff association representing police officers in Scotland, documented their opposition to police officers in Scotland carrying naloxone, citing concerns over its effectiveness in reducing the high rates of drug-related deaths in Scotland, the safety of naloxone administration, and officer liability if a person was harmed following administration of naloxone (SPF 2021). The SPF also indicated that police were overworked and being called to administer naloxone to 'fill the void' of an under-resourced ambulance service. The SPF expressed concern about long waiting times for an ambulance and used the term 'mission creep' around the changing role of police officers.

These concerns around 'mission creep' of policing into the public health sphere and the worry over legal liability may well be related to another barrier: research suggests that some officers' stigmatising attitudes towards PWUD, along with pessimistic attitudes towards drug treatment, contribute to officers' resistance to the carriage and administration of naloxone (Murphy and Russell 2020, Winograd *et al*. 2020, Adams 2021, Speakman *et al*. 2023). Importantly, while some police officers may hold stigmatising attitudes towards PWUD and/or to drug treatment, despite these beliefs these officers must still uphold their duty and respond to PWUD and overdoses appropriately. Exploring police attitudes and responses to PWUD/overdoses facilitates understanding of the

complexity at play in overdose situations. Training officers to understand drug use, overdose, and the administration of naloxone is key for enabling officers to carry naloxone so that they are equipped to reverse opioid overdoses and potentially contribute to reducing drug-related deaths. A variety of harm reduction training programmes for police have been published in the academic literature, and many of these have been reviewed by Khorasheh *et al*. (2019), who concluded that integrating harm reduction principles into international police education was imperative.

Between March and October 2021, Police Scotland implemented a pilot (test of change) for the carriage and administration of intranasal naloxone by police officers, as an emergency first aid measure for persons suspected of experiencing an opioid overdose. The pilot took place when emergency services were under considerable pressure due to the impact of the COVID-19 pandemic. During 2021, ambulance crews were responding to unprecedented numbers of calls, military forces were deployed to assist (Scottish Government 2021), and police were increasingly involved in transporting patients to hospitals (McPhee 2021). Therefore, the current paper reports an evaluation of the impact of the training provided to police officers for the carriage of naloxone pilot in Scotland. The evaluation included police officers' knowledge of, and attitudes towards, opioid overdose and naloxone administration; risk compensation beliefs; acceptability of the intervention; and attitudes towards PWUD. This paper supplements our previous publication reporting the qualitative findings of the pilot evaluation related to acceptability and experiences of naloxone carriage (Speakman *et al*. 2023). This paper also describes the impact stemming from both the evaluation of the training and the pilot, including that Police Scotland mandated all officers across Scotland to be equipped with intranasal naloxone as part of their standard first aid kit from August 2022.

Methods

Training format and content

Naloxone training was conducted in person in police offices within the pilot sites between March and October 2021. The three original pilot sites were large urban areas with the highest prevalence of DRDs in Scotland. Three smaller sites were added as the pilot evolved, in response to interest in the intervention. These included a rural area, a community policing team, and a custody team. This evaluation also included these additional sites, given the potentially valuable information for these different contexts.

The training was developed by the *Scottish Drugs Forum* (a national NGO responsible for naloxone training and education) in partnership with *Police Scotland*. While police officer attendance at the training was compulsory, the decision whether to subsequently carry naloxone was voluntary. All officers in the pilot areas were invited to attend a single training session lasting approximately two hours. The training was conducted under COVID-19 pandemic social distancing restrictions. Training was led by a team of police trainers that included a constable, inspectors, and a sergeant. The core training team was supplemented by a range of experts which included medical and legal professionals. An Assistant Chief Constable (ACC; part of the executive leadership team) attended the majority of training sessions. The exact training team varied from session to session depending on staff availability.

The training material consisted of a slide presentation and a series of videos. Video content included: the Chief Constable introducing the pilot; police officers who had used naloxone prior to the pilot with a positive result; Canadian police officers talking about their naloxone project; a person with lived experience of drug use who had overdosed and survived due to naloxone and went on to rebuild her life; and a person who had lost her son to overdose who was advocating for wider availability of naloxone and for police to carry it. The training was designed to 'understand and demonstrate the administration of intranasal naloxone to a casualty suffering from an opioid-related drug overdose'. The training also focused on understanding drug-related deaths and opioid overdose; recognising overdose; basic first aid; understanding naloxone and how to administer it; post-administration considerations; and relevant legislation and procedures.

The main training content was supplemented by a Question and Answer (Q&A) session. This gave officers an opportunity to ask questions and discuss any concerns. Early presentations began with the Q&A session, but this was subsequently moved to the end for later sessions. Videos to support the slide presentation were not always shown and were instead made available on a dedicated website. Concerns about legal liability were addressed by the presence at many training sessions of the Head of Investigations for the Police Investigations and Review Commissioner (PIRC), who assured officers that there would be no PIRC investigation if a person were to come to harm following an administration of naloxone.

At the conclusion of each session, all officers were reminded that their participation in the pilot was voluntary. Personal issue pouches containing two intranasal naloxone packs were made available for officers to take if they chose. The ACC had already left the training by this point to avoid any perception of pressure on officers to take the kits. The number of kits remaining after trainees had left was recorded.

Recruitment

A total of 808 police officers were involved in the pilot. All 808 officers were invited to participate in the evaluation and to complete the online survey reported in the current paper. Officers were recruited through emails sent via police officer gatekeepers, intranet notices, and posters displayed on police premises. Officers did not receive any compensation for participating in the evaluation.

Data collection

Data were collected between March and November 2021. Police officers were asked to complete an anonymous survey at three time-points: pre-training (within two weeks prior to training) post-training (within two weeks of attending training) and follow-up (three months after training). As there was a rolling training programme, the time between training and survey completions varied. *Novi Survey* was used to distribute a consent form, a demographics form, and a series of questionnaires as detailed in the outcome measures section, below.

Outcome measures

The main outcome measures in the survey were the Opioid Overdose Knowledge Scale (OOKS) and the Opioid Overdose Attitudes Scale (OOAS) (Williams *et al*. 2013). As this was training delivered as part of a police pilot, there was no primary outcome measure, rather a range of candidate main outcome measures were used with a view to select the best measure for a subsequent definitive study of effectiveness. The original scales were tested for internal consistency and content reliability. Both scales were designed for naloxone administered by injection and were adapted by the project team for intranasal naloxone (see Appendix 1).

The OOKS aims to assess changes in knowledge of opioid overdose and naloxone administration. The OOKS items used a 'yes/no or don't know'; or 'true/false or don't know' response format. The adapted OOKS total score ranged from 0 to 45. It was scored using four domains:

- Risk: risk factors for an overdose (9 items, score range 0–9)
- Signs: signs of an overdose (10 items, score range 0–10)
- Action: actions to be taken in an overdose (11 items, score range 0–11)
- Naloxone Use: naloxone effects, administration, and aftercare procedures (15 items, score range 0–15).

A higher OOKS score represents a higher level of knowledge about drug overdose and naloxone administration.

The OOAS aims to assess changes in attitudes towards drug overdose and naloxone administration. The OOAS is scored using a 5-point Likert scale: completely disagree (1 point), disagree (2 points), unsure (3 points), agree (4 points) and completely agree (5 points). The OOAS was adapted from the original tool, with two questions removed: one that did not apply to police officers, and one that applied to the injection of naloxone only. Therefore, the adapted OOAS had a total mean score and three sub-scale mean scores, with items and score ranges as follows:

- Competence (to respond to an overdose) (10 items; 10–50)
- Concerns (about intervening) (6 items; 6–30)
- Readiness (willingness to intervene) (10 items; 10–50)
- Total score (26 items; 26–130).

A higher OOAS score represents a higher level of competence to respond to an overdose, fewer concerns about intervening when a person has overdosed, and being more ready to respond to help a person who is overdosing.

There were three other outcome measures in the survey. Six items adapted were from White *et al*. (2021) addressing the role of police officers in dealing with drug overdoses. Seven questions addressed police officers' attitudes towards drug dependence and reflected officers' 'sympathy and care'. These were adopted from Bryan *et al*. (2016). The five-item Naloxone-Related Risk Compensation Beliefs Scale (NaRRC-B) was also included (Winograd *et al*. 2020: see Appendix 2).

Data analysis

Quantitative data were primarily analysed using RStudio Team (2020) (v. 4.2.1) following a 'tidyverse' workflow (Wickham *et al*. 2019). Supplementary analysis was conducted using *Microsoft Excel*. Descriptive statistics were used to summarise demographics, attitudes and knowledge of naloxone, and impact of the training. Participants provided their own unique identifier following instructions using memorable information, which enabled an assessment of whether survey responses were completed by the same or different respondents across the pre-training, post-training and follow-up stages. As the current research was an evaluation of a pilot assessing the feasibility and acceptability of naloxone carriage, with related changes in officers' attitude and knowledge, this was not a definitive study powered to detect the effectiveness of the training and no formal statistical comparisons were made between survey stages. Rather, the mean (standard deviations), mean change scores and effect sizes were estimated for all main outcome measures to assess if the training had the desired impact in the expected direction, to provide a rudimentary assessment of the magnitude of mean change score differences, and to determine the candidate primary outcome measure for a future definitive study.

Results

Training uptake

By the end of the pilot in October 2021, 808 officers had been trained in the use of naloxone across 5 sites. In these areas, 87% of the total workforce were trained. The voluntary carriage of naloxone packs at the end of training sessions was estimated at 81% of officers who attended the training (equating to 656 officers/packs). During the pilot, 51 naloxone administrations to reverse near-fatal opioid overdoses were reported, equating to almost 8% of total packs carried by officers. No adverse effects of naloxone administration were reported.

Survey response and demographics

A total of 346 police officers participated in at least one of the survey questionnaires, representing 43% of the 808 officers invited to participate. Not all officers completed the survey at every time-point, with 23%, 20% and 11% of 808 officers responding pre-training, post-training and follow-up, respectively. Only 34 officers completed the pre-training and post-training surveys, and only 6 officers completed all 3 surveys. Descriptive analysis using frequencies and percentages are presented for the demographic data (Table 1). The majority of participating officers were male (64%), aged 25–44 (74%), constables (76%) and had higher education qualifications (53%). Officers with five or less years' service represented over a third of respondents (37%).

Police officers' knowledge and attitudes

All pre-training scores on the OOKS were in the top 25% of the maximum score possible, except for 'Naloxone use' domain (66% of maximum) (Table 2). Therefore, officers were already knowledgeable on the domains 'Action', 'Risk', 'Signs', scoring 88%, 80% and 75% of the maximum possible scores for these domains. This was also reflected in the pre-training mean total OOKS score of 35.8, which represents 80% of the maximum score of 45.

Table 1. Demographics of survey sample.

Variable	Pre-training Max $N = 167$	(%)	Post-training Max $N = 144$	(%)	Follow-up Max $N = 88$	(%)
Gender						
Male	111	67%	77	59%	58	66%
Female	49	30%	49	37%	27	31%
Other/prefer not to say	5	3%	5	4%	3	3%
Age						
<25	6	4%	7	5%	6	7%
25–34	75	45%	51	39%	34	39%
35–44	46	28%	42	32%	34	39%
45+	31	19%	27	21%	11	13%
Other/prefer not to say	8	5%	3	2%	3	3%
Location						
Dundee	74	45%	44	35%	35	41%
Falkirk	0	0%	32	26%	14	16%
Glasgow	80	49%	39	31%	27	32%
Other/prefer not to say	9	6%	10	8%	9	11%
Education						
Secondary	34	20%	37	28%	17	19%
Further	37	22%	27	21%	13	15%
Higher	85	51%	60	46%	54	61%
Other/prefer not to say	11	7%	6	5%	4	5%
Ethnicity						
White Scottish/British/Irish/European	153	92%	125	96%	82	93%
Asian/Black/Mixed or Other/Prefer not to say	14	8%	5	4%	6	7%
Length of service						
Service: <5	70	42%	42	33%	31	35%
Service: 6–10	29	17%	23	18%	13	15%
Service: 11–15	28	17%	31	24%	16	18%
Service: 16–20	17	10%	19	15%	16	18%
Service: 21+	14	8%	12	9%	11	13%
Other/prefer not to say	9	5%	2	2%	1	1%
Rank						
Constable or special constable	133	80%	101	77%	63	72%
Sergeant	20	12%	17	13%	13	15%
Inspector or higher rank	7	4%	10	8%	6	7%
Other/prefer not to say	7	4%	3	2%	6	7%

Notes: (1) % each variable is computed using the sub-total of completed responses for that variable, e.g. 167 completed the pre-training survey but 165 provided data for gender. (2) Fewer than five special constables responded. These were incorporated into one category to avoid disclosure due to sparse data.

Table 2. Opioid Overdose Knowledge Scale (OOKS).

Category	Pre-training Mean (SD) ($n = 164$)	Post-training Mean (SD) ($n = 144$)	Follow-up Mean (SD) ($n = 88$)	Mean change score Pre-training to post-training (Cohen's d)	Mean change score Pre-training to follow-up (Cohen's d)	Mean change score Post-training to follow-up (Cohen's d)
Risk	7.2 (2.1)	7.5 (1.7)	7.3 (2.2)	0.3 (0.16)	0.1 (0.05)	−0.2 (0.10)
Signs	7.5 (1.8)	8.9 (1.2)	8.5 (1.4)	1.4 (0.92)	1.0 (0.62)	−0.4 (0.31)
Action	9.7 (1.1)	9.9 (1.0)	9.9 (0.8)	0.2 (0.19)	0.2 (0.21)	0.0 (<0.00)
Use	9.9 (2.0)	11.2 (1.5)	10.7 (1.6)	1.3 (0.74)	0.8 (0.44)	−0.5 (0.32)
Total	35.8 (4.7)	38.6 (3.2)	37.6 (3.9)	2.8 (0.70)	1.8 (0.42)	−1.0 (0.28)

Note: Cohen's d effect size for two samples with unequal standard deviations is reported.

In every domain, an increase in all scores was observed, indicating that training led to improvement in knowledge both post-training and at follow-up. The total mean score increased from 35.8 on average to 38.6 post-training, with an average increase of 6% of the maximum total score of 45. The largest increases were observed in the domains 'Signs' and 'Naloxone Use'. The follow-up survey data indicated a persistent training effect, with all mean scores at follow-up greater than those observed pre-training, although there were small reductions in scores observed for domain and total scores at follow-up compared with post-training. Scrutinising the effect size data, the greatest change can be seen in the 'Signs' domain, particularly from pre- to post-training, although the effect size is still 'moderate-to-large' from pre-training to follow-up. The 'Action' domain remained consistently high across the three survey stages. Exploring the total score, the effect size pre- to post-training was 'moderate-large', at $d = 0.70$, but dropped to 'moderate-small' ($d = 0.42$) indicating that the training improved knowledge mostly post-training, and although to a lesser extent, knowledge continued to be higher at the follow-up point.

From pre-training to post-training there was an increase in the OOAS mean scores across all sub-scale and total mean scores, strongly suggesting training had a positive overall effect on police officers' attitudes to opioid overdoses (Table 3). The OOAS total mean score improved from 87.8 pre-training to 101.6 post-training, a change score of 13.8 and an 11% increase of the maximum score of 130. The OOAS 'competence' sub-scale showed the most improvement, followed by 'concerns' and 'readiness'. Scores from pre-training to follow-up also demonstrated improvements across all sub-scales and total scores, indicative of a sustainable training effect. The total score improved from 87.8 at pre-training to 100.7 at follow-up, an increase of 12.9, and 10% of the maximum score of 50, and consistent with a sustainable training effect. The effect size data indicates a 'large' effect size ($d = 1.23$) from pre- to post-training, and from pre-training to follow-up ($d = 1.05$), demonstrating positive changes in overall attitudes. The decline in training effect on attitudes from post-training to follow-up was negligible, with very small effect sizes in each domain and overall, indicating a sustained and overall positive change in attitudes.

Police officers' role

The survey included six questions that addressed police officers' views of naloxone in relation to their role, adapted from White *et al*. (2021) and supplemented by tailored questions (Table 4). There were

Table 3. Opioid Overdose Attitudes Scale (OOAS).

Category	Pre-training Mean (SD) $N = 161$	Post-training Mean (SD) $N = 143$	Follow-up Mean (SD) $N = 86$	Mean change score Pre-training to post-training (Cohen's d)	Mean change score Pre-training to follow-up (Cohen's d)	Mean change score Post-training to follow-up (Cohen's d)
Competence	31.2 (5.6)	39.3 (4.4)	39.4 (5.7)	8.1 (1.61)	8.2 (1.45)	−1.3 (0.02)
Concerns	17.8 (4.7)	21.6 (4.8)	21.4 (5.1)	3.8 (0.80)	3.6 (0.73)	−0.1 (0.04)
Readiness	38.7 (4.2)	40.7 (4.6)	40.0 (5.8)	2.0 (0.45)	1.3 (0.26)	−1.1 (0.13)
Total	87.8 (11.2)	101.6 (11.2)	100.7 (13.3)	13.8 (1.23)	12.9 (1.05)	−2.6 (0.07)

Note: Cohen's d effect size for two samples with unequal standard deviations is reported.

Table 4. Police officer role questions.

Item	Pre-training Disagree $N = 157$ (%)	Pre-training Agree/unsure $N = 157$ (%)	Post-training Disagree $N = 142$ (%)	Post-training Agree/unsure $N = 142$ (%)	Change pre to post Agree/unsure (%)	Follow-up training Disagree $N = 83$ (%)	Follow-up training Agree/unsure $N = 83$ (%)	Change pre- to final Agree/unsure (%)
All Police Scotland officers should carry naloxone	87 (55%)	70 (45%)	46 (32%)	96 (68%)	**23%**	33(40%)	50 (60%)	**15%**
I look forward to/am glad to be carrying naloxone	70 (45%)	85 (55%)	43 (30%)	99 (70%)	**15%**	24 (29%)	59 (71%)	**16%**
I am better able to perform my job with naloxone	73 (46%)	84 (54%)	54 (38%)	88 (62%)	**6%**	40 (36%)	53 (64%)	**10%**
I am worried about accidental exposure to opioids/heroin	81 (52%)	76 (48%)	111 (78%)	31 (22%)	**−26%**	66 (80%)	17 (20%)	**−28%**
Ambulance services should ideally be the first to respond to overdose	11 (7%)	146 (93%)	12 (8%)	130 (92%)	**−1%**	4 (5%)	79 (95%)	**2%**
Police should have the ability to respond to overdose if they are on the scene before other emergency services	34 (22%)	123 (78%)	17 (12%)	125 (88%)	**10%**	11 (13%)	72 (87%)	**9%**

Notes: (1) Officers were asked to rate statements from strongly disagree, disagree, unsure, agree, strongly agree. The answers were aggregated as follows: disagree = (strongly disagree + disagree); agree or unsure = (unsure + agree + strongly agree). Unsure was incorporated into the category of agree/unsure as the overriding interest was a change in the proportion of officers who disagreed with the statements. (2) An increase in percentage from pre-training to post-training represents a change in favour of a positive training impact on carriage of Naloxone. The exception to this is the question about being worried about accidental exposure to opioids/heroin, where a % reduction is in favour of a positive impact of training. White *et al.* (2021) used a 4-point Likert scale in their version.

improvements in officers' views towards naloxone between pre-training and post-training. In response to, 'All Police Scotland officers should carry naloxone', 15% agreed officers should carry naloxone pre-training versus 40% post-training (2.7 times more). Conversely, more than half (55%) of officers pre-training disagreed they should carry naloxone, versus almost one-third (32%) of officers after training. At pre-training, 19% officers agreed with 'I look forward to/am glad to be carrying naloxone', versus 46% after training (2.4 times more). Fewer than half (44%) agreed 'Police should have the ability to respond to overdose if they are on the scene before other emergency services' pre-training versus 70% post-training. Between pre-training and follow-up there was an improvement across all items.

Police officers' attitudes towards people with drug dependence

Seven questions (five positive and two negatively framed) addressed police officers' attitudes and reflect officers' 'sympathy and care' for people with drug dependence (Bryan *et al.* 2016). Question responses 'agree strongly or slightly' or 'disagree strongly or slightly' were combined into categories of 'agree' or 'disagree', respectively (Table 5). Pre- to post-training officer responses indicated some positive attitude shifts, notably increased agreement on 'drug dependence is often caused by traumatic experiences, such as abuse, poverty or bereavement' (Q.4: 63–70%); 'we need to adopt a far more tolerant attitude towards people with a history of drug dependence in our society' (Q.5: 33–42%); and 'we have a responsibility to provide the best possible care for people with drug dependence' (Q.6: 51–67%). There was a slight increase in disagreement with, 'people with drug dependence don't deserve our sympathy' (Q.7: 68–72%).

Table 5. Bryan *et al*. (2016) questions.

	Agree	Neither agree or disagree	Disagree	Don't know/ Prefer not to say
Pre-training (*N* = 157; 100%)				
(1) Drug dependence is an illness like any other long-term chronic health problem	54.78%	15.92%	26.11%	3.18%
(2) People who become dependent on drugs are basically just bad people	1.27%	8.28%	87.26%	3.18%
(3) Virtually anyone can become dependent on drugs	75.64%	9.62%	12.18%	2.56%
(4) Drug dependence is often caused by traumatic experiences, such as abuse, poverty or bereavement	63.46%	14.10%	17.95%	4.49%
(5) We need to adopt a far more tolerant attitude towards people with a history of drug dependence in our society	33.33%	29.49%	30.13%	7.05%
(6) We have a responsibility to provide the best possible care for people with drug dependence	50.96%	28.66%	17.20%	3.18%
(7) People with drug dependence don't deserve our sympathy	7.01%	19.75%	67.52%	5.73%
Post-training (*N* = 142; 100%)				
(1) Drug dependence is an illness like any other long-term chronic health problem	**57.04%**	7.04%	31.69%	4.23%
(2) People who become dependent on drugs are basically just bad people	3.52%	9.86%	85.92%	0.70%
(3) Virtually anyone can become dependent on drugs	72.54%	9.86%	16.20%	1.41%
(4) Drug dependence is often caused by traumatic experiences, such as abuse, poverty or bereavement	**69.72%**	11.27%	10.56%	8.45%
(5) We need to adopt a far more tolerant attitude towards people with a history of drug dependence in our society	**41.55%**	28.87%	26.76%	2.82%
(6) We have a responsibility to provide the best possible care for people with drug dependence	**67.61%**	19.01%	11.97%	1.41%
(7) People with drug dependence don't deserve our sympathy	5.63%	20.42%	**71.83%**	2.11%
Follow-up (*N* = 80; 100%)				
(1) Drug dependence is an illness like any other long-term chronic health problem	**58.75%**	13.75%	23.75%	3.75%
(2) People who become dependent on drugs are basically just bad people	3.75%	15.00%	73.75%	7.50%
(3) Virtually anyone can become dependent on drugs	71.25%	11.25%	13.75%	3.75%
(4) Drug dependence is often caused by traumatic experiences, such as abuse, poverty or bereavement	62.50%	18.75%	12.50%	6.25%
(5) We need to adopt a far more tolerant attitude towards people with a history of drug dependence in our society	**38.75%**	21.25%	36.25%	3.75%
(6) We have a responsibility to provide the best possible care for people with drug dependence	**70.00%**	11.25%	16.25%	2.50%
(7) People with drug dependence don't deserve our sympathy	12.50%	18.75%	66.25%	2.50%

Notes: (1) Questions 2 and 7 are reverse coded, i.e. 'Disagree' is a positive result. (2) Improvements in scores from pre-training are in bold. (3) The numbers provided are the numbers for each stage that officers answered this questionnaire.

Discussion

Knowledge and attitudes of police officers

Improvement in the OOKS and OOAS scores (Williams *et al*. 2013), pointed to the effectiveness of the training in terms of improving the knowledge and attitudes of police officers about drug overdose and naloxone administration. The questions adapted from White *et al*. (2021) indicated a consistent improvement across all items (pre-training to follow-up), highlighting an improvement in officers' willingness to carry and use naloxone.

Findings from the Bryan *et al*. (2016) questions indicated there were some improved attitudes towards PWUD at post-training, and to a lesser degree at follow-up. However, the findings also suggested that a significant proportion of officers did not align themselves with the prevalent scientific view, that drug dependence is a medical condition affected by social deprivation and traumatic experiences (SAMHSA 2014, Scottish Government 2018). Dissenting views may be considered as 'stigmatising' PWUD (Kruis *et al*. 2020). Evidence has suggested that police officers may have a particular

tendency to stigmatise PWUD and be opposed to harm reduction strategies more broadly (Murphy and Russell 2020, Selfridge *et al*. 2020, Berardi *et al*. 2021). However, when our data are compared to Bryan *et al*.'s (2016) data for the general population in Scotland, police officers' views were significantly less stigmatising for four of seven items used in the evaluation survey, indicative of police being more knowledgeable about drug use and related problems, and more sympathetic and caring towards PWUD than the general population. This was supported by qualitative data from Speakman *et al*. (2023), showing that many police officers were compassionate and caring towards people with drug problems. Several officers also demonstrated considerable experience in engaging with and supporting PWUD. Police held similar views to the general population for the other three questions from Bryan *et al*. (2016) and findings suggest more work is needed to educate officers about problematic drug use, how best to reduce harm and, where appropriate, support recovery (Scottish Government 2018, Williams *et al*. 2019). As highlighted in the introduction, there is therefore a complex interplay between attitudes and responses; while some police officers (not all) may hold stigmatising attitudes towards PWUD, overdoses, and/or naloxone administration, it is not clear how and whether this will or does affect their responses to PWUD, overdoses, and/or naloxone. Future research exploring the interaction between attitudes and responses would be beneficial to inform training and intervention development, to identify where such interventions or training are needed.

Public health policing

Survey questions that addressed the carriage of naloxone as part of police officers' role indicated that there was a substantial minority who were resistant to the initiative. This reflected the SPF's discourse at the time, of 'mission creep', workload, safety and liability. More training focused on assisting officers to support people with multiple complex needs, including drug overdosing and mental health crises may support officers with the evolving policing role in Scotland. Rather than being perceived as 'mission creep', carriage and administration of naloxone is in line with the purpose of policing enshrined in the Police and Fire Reform Scotland Act (2012) – to enhance the well-being and safety of individuals and communities. Police Scotland have committed to a Public Health approach to policing (Police Scotland and Public Health Scotland 2021). Harm reduction interventions, including naloxone, should be adopted within a wider public health approach to policing, in partnership with other emergency and health and social care services (van Dijk and Crofts 2017, Black 2020, del Pozo *et al*. 2021), as exemplified by a pilot evaluation elsewhere (Dougall *et al*. 2023). Training should also focus on how officers can work effectively in partnership with other services, for example, coordinated emergency service response strategies as well as referral pathways (Dahlem *et al*. 2017). Much of this requires that the policing workforce be suitably resourced and supported for this expanding role, while more broadly, government and public funding bodies must suitably resource other emergency services, specialist drug services and other relevant health and social care services to facilitate effective partnership working to have an impact on drug-related deaths in Scotland.

Developing training

Developing ongoing training on problematic drug use may be particularly important as police officers are more frequently exposed to drug overdoses, with research by Murphy and Russell (2020) suggesting that such officers are less likely to endorse public funding for drug treatment, play a role in referring PWUD to treatment, or believe drug treatment is effective. Murphy and Russell (2020) suggested that these negative attitudes were the result of compassion fatigue. They highlight that police attitudes towards people who use drugs can have an impact on community attitudes and the provision of services.

The need for more extensive training to understand problematic drug use is supported by Berardi *et al*. (2021), who argue that to effectively implement naloxone in a police organisation, 'officers must be sufficiently knowledgeable and concerned about the [opioid] situation to see it as a serious risk to

be managed' (p. 269). While this context is distinct from Scotland, the principle may hold true: ensuring that officers have a good understanding of the DRD crisis in Scotland is likely to facilitate their motivation to use naloxone.

The practical limitations of providing effective training for a substantial number of officers may have posed challenges for the quality of the training programme. Police Scotland have since translated the programme into an online training module and committed to providing routine training to address the stigmatisation of PWUD. The effectiveness of these training programmes remains uncertain and merits on-going evaluation. Changing police culture and addressing stigmatisation of PWUD may be more effectively addressed through experiential learning and critical reflective practice approaches to police education (Christopher 2015, Bacon 2022). More broadly, a rigorous evaluation is needed to determine the impact of police carriage of naloxone on DRDs, as well as revealing other positive or unintended consequences of the initiative.

Based on the perceived success of the pilot, and the overall positive findings from our evaluation, the then Chief Constable of Police Scotland mandated that all officers routinely carry intranasal naloxone from August 2022 (Police Scotland 2023). The Scottish Government agreed to fund the initiative. The SPF have since withdrawn their opposition to the initiative and have agreed to support officers who administer naloxone (SPF 2023). To May 2024, naloxone had been used by Police Scotland officers 520 times to reverse opioid poisonings (personal communication, Police Scotland). This suggests that police officers in Scotland are both willing and able to intervene to save the life of a person experiencing a drug overdose. Notably, subsequent to the pilot and evaluation, the SPF have agreed to support officers who administer naloxone (SPF 2023), further demonstrating the effectiveness of evidence-based approaches.

Limitations

The response rate to the survey was limited. It diminished over the three stages, and only a small number of officers completed more than one stage. It is possible that the discourse of dissent fostered by the SPF affected the response to the evaluation survey, in addition to officers perceiving a lack of time and incentive to participate in an online survey on three occasions. Notably, no officers from one of the areas completed stage one of the survey and officers participating in the survey may have been biased towards those who supported the initiative. However, the research team made every effort to encourage all officers who were members of the SPF to share their views. Although the survey has limited generalisability due to these issues, the response rate was respectable in relation to comparable surveys among police officers (Nix *et al*. 2019).

Conclusion

Our evaluation of the naloxone pilot in Police Scotland demonstrated that the training was broadly effective in developing officer's knowledge of and attitudes towards drug overdose and naloxone administration. Findings were used as evidence to support the roll-out of the intervention across Scotland and the intervention has reversed hundreds of overdoses since. Putting resources into evaluation makes for a powerful argument to stop or implement an initiative. Policing interventions that are supported by rigorous evidence will invariably be the most effective. Taking an evidence-based approach to policing requires police leadership which is willing to be innovative and to challenge dysfunctional aspects of policing culture. Police Scotland have been progressive in adopting naloxone, within a public health approach to policing.

Ethics approval

Permission to conduct this research was supplied by *Partnerships and Collaboration, Corporate Services Division* at Police Scotland. Ethical approval was provided by the School of Health and Social Care Research Integrity Committee at Edinburgh Napier University.

Consent for publication

Research participants provided consent for the anonymised data to be published.

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Data availability statement

The datasets analysed during the current study are not publicly available as they have not been fully anonymised and may compromise participants' right to confidentiality.

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Appendices

Appendix 1. Opioid Overdose Knowledge Scale (OOKS) and Opioid Overdose Attitudes Scale (OOAS) adaptations

The OOKS and OOAS were adapted from Williams *et al*. (2013) with permission from Dr Anna Williams. As OOKS was originally designed for intravenous administration of naloxone, the questionnaire was adapted for intranasal administration. This did not affect the overall scoring (0–45) or the domain scores. Some changes were made to the timings of the effects of naloxone in consultation with an expert at the Scottish Drugs Forum. Changes to OOKS were as follows:

Questions	Original answers	Edited or added answers (T = true; F = False)
How can naloxone be administered?	–	Inside the nose (intranasal) (T); Don't know.
How long does naloxone take to start having an effect?	2–5 min	2–3 min (T)

(*Continued*)

Continued.

Questions	Original answers	Edited or added answers (T = true; F = False)
How long do the effects of naloxone last for?	Less than 20 min About 1 h 1–6 h 6–12 h	20–30 min (F) About 4 h (T) 6–12 h (F) 24 h (F)
Removed question:		
• Where is the most recommended place for non-experts to administer naloxone?		

OOAS was also adapted. Two questions were removed: one did not apply to police officers, and one only applied to injecting naloxone. The adaptation changed the total score to 26–130 (28–140 originally) and the concern score to 6–30 (8–40 originally). Changes to OOAS were as follows:

Removed questions:
- I would be concerned about calling emergency services in case the police come around.
- Needles frighten me and I wouldn't be able to give someone an injection of naloxone.

Edited questions (original text in square brackets):
- I am already able to administer [inject] naloxone into someone who has overdosed.
- I would be afraid of suffering a needle stick injury (from the individuals injecting equipment and drug paraphernalia) if I had to administer nasal naloxone [if I had to give someone a naloxone injection].

Appendix 2. Details about and findings relating to the NaRRC-B scale

The NaRRC-B was adopted from Winograd *et al*. (2020) to understand the effect of the naloxone training on risk compensation beliefs. Because the current paper focuses on knowledge and attitudes, we present the findings relating to this scale in this appendix to avoid complicating the narrative of the paper whilst also being transparent about the related measures applied within the current study.

According to Winograd *et al*. (2020), risk compensation 'reflects a cognitive behavioural process by which people may engage in riskier behaviours when they perceive their environment to have greater safety measures in place to protect them from adverse consequences' (p. 245). NaRRC-B consists of five questions scored on a scale of 1–5 (strongly disagree to strongly agree). The total score ranges from 5 to 25. Higher scores on the NaRRC-B scale indicate greater endorsement of naloxone-related risk compensation beliefs, i.e. if the training has had its desired effect the post-training mean scores should be lower than those at pre-training.

Police officers' risk compensation beliefs

Table A1 presents the findings for the NaRRC-B scale based on independent observations from all officers who responded. The total score of five questions observed pre-training, post-training and follow-up was 13.6, 12.8 and 13.4, respectively. Only very small decreases are present, reflecting that the training had negligible impact on the questions posed. Given that the OOKS and OOAS demonstrated improvements between the survey time-points, this suggests that the NaRRC-B scale lacked the sensitivity needed to detect differences in responses of this sample.

Table A1. Naloxone-Related Risk Compensation Beliefs (NaRRC-B) scale.

Item	Pre-training ($n = 158$) Mean (SD)	Post-training ($n = 142$) Mean (SD)	Follow-up ($n = 83$) Mean (SD)	Pre to post-training Mean difference	Pre-training to follow-up Mean difference
(1) Opioid/heroin users will use more opioids/ heroin if they know they have access to naloxone	3.0 (1.0)	2.9 (1.0)	2.9 (1.1)	−0.10	−0.08
(2) Opioid/heroin users will be less likely to seek out treatment if they have access to naloxone	3.0 (0.8)	2.9 (1.0)	2.8 (1.1)	−0.11	−0.22
(3) Providing naloxone to overdose victims sends the message that I am condoning opioid misuse	2.4 (0.9)	2.3 (1.0)	2.5 (1.2)	−0.09	0.14

(*Continued*)

Table A1. Continued.

Item	Pre-training ($n = 158$) Mean (SD)	Post-training ($n = 142$) Mean (SD)	Follow-up ($n = 83$) Mean (SD)	Pre to post-training Mean difference	Pre-training to follow-up Mean difference
(4) There should be a limit on the number of times one person receives naloxone to reverse an overdose (refers to multiple overdose events, do not count repeated dose administrations during one overdose event)	2.4 (0.9)	2.1 (0.9)	2.4 (1.1)	−0.25	0.01
(5) Naloxone is enabling for drug users (i.e. it enables them to continue or increase drug use when they otherwise might not)	2.8 (0.9)	2.6 (1.0)	2.8 (1.1)	−0.21	−0.03
Total	13.6 (3.4)	12.8 (4.1)	13.4 (4.9)	−0.78	−0.20