



HHS Public Access

Author manuscript

J Subst Abuse Treat. Author manuscript; available in PMC 2022 October 01.

Published in final edited form as:

J Subst Abuse Treat. 2021 October ; 129: 108412. doi:10.1016/j.jsat.2021.108412.

Racial differences in overdose training, naloxone possession, and naloxone administration among clients and nonclients of a syringe services program

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Abstract

Objective.—To evaluate racial (Black/White) differences in overdose response training and take-home naloxone (THN) possession and administration among clients and nonclients of the Baltimore syringe service program (SSP).

Methods.—The study derived data from a cross-sectional survey of 263 (183 SSP clients, 80 nonclients) people who inject drugs (PWID). The study recruited SSP clients using targeted sampling and recruited nonclients through peer referral from April to November 2016.

Results.—In our sample, 61% of the participants were Black, 42% were between the ages of 18 and 44, and 70% were males. SSP clients, regardless of race, were more likely to have received overdose response training than Black nonclients (Black clients AOR: 3.85, 95% CI: 1.88, 7.92; White clients AOR: 2.73, 95% CI: 1.29, 5.75). The study found no significant differences in overdose response training between Black and White nonclients. SSP clients and White nonclients were more likely to possess THN than Black nonclients (Black clients: AOR: 4.21, 95% CI: 2.00, 8.87; White clients: AOR: 3.54, 95% CI: 1.56, 8.04; White nonclients AOR: 4.49, 95% CI: 1.50, 13.47).

Conclusion.—SSP clients were more likely to receive overdose response training than their nonclient peers who they referred to the study, illustrating the utility of SSPs in reaching PWID at high risk of overdose. We also observed that Black PWID, who did not access services at the

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Contributors: Jones A.A. conceptualized and conducted the analyses, and wrote the initial draft of the article. All authors provided substantial contributions in the conception of the study, the interpretation of the findings, critical revisions, and approved the final version of the article.

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SSP, were the least likely to possess THN, suggesting the need to employ outreach targeting Black PWID who do not access this central harm reduction intervention.

Keywords

THN; Take-home naloxone; Race; Syringe services programs

1. Introduction

1.1 Syringe services programs, overdose response training, and take-home naloxone (THN)

For more than 30 years in the United States, syringe services programs (SSPs) have been a public health strategy that cities and states have implemented to prevent morbidity and mortality from drug use and to foster drug use cessation (Kidorf, Brooner, Leoutsakos, & Peirce, 2018). Research has shown SSPs to be associated with reduced incidents of HIV, HCV, other adverse consequences of drug addiction and to serve people who inject drugs (PWID) who are at high risk for overdoses (Barboza & Angulski, 2020; Park et al., 2018; Uyei et al., 2017; Abdul-Quader et al., 2013). As such, SSPs are often an avenue for PWID to receive overdose response training and take-home naloxone (THN), an opioid antagonist used to reverse opioid overdoses (Eggleston et al., 2018; Lewis et al., 2016; Wheeler, Jones, Gilbert, & Davidson, 2015). Rowe and colleagues (2016) found that greater distance from SSPs was associated with decreased THN overdose reversals. Overall, nationwide data from 136 of the 140 health services organizations known to distribute THN kits revealed more than 26,000 reports of overdose reversals from 1996 to June 2014 (Wheeler et al., 2015).

1.3 Response to opioid overdose deaths and race

A sharp surge in overdose deaths has occurred in recent years and in three distinct waves; the first wave was driven by prescription opioids, the second wave by heroin, and the third wave by a polydrug combination of synthetic opioids (fentanyl) and other drugs (Ray et al., 2020). While opioid overdose deaths have skyrocketed in recent years, opioid use, particularly heroin use, has been historically endemic in many urban centers and concentrated in communities of color (Hansen & Netherland, 2016). Interestingly, the recent surge in opioid-related deaths has been met with a more treatment-centered approach rather than the historically punitive approach to drug use, resulting in the broad availability of overdose response training, overdose reversal drugs (naloxone), and opioid use disorder treatment, (Hansen & Netherland, 2016). While this new approach represents a significant shift in how PWID are treated, communities of color continue to be left behind. The United States saw a 4% decrease in drug overdose deaths from 2017 to 2018, with a 4% and 13.5% decrease in heroin and prescription opioid-related deaths, respectively (CDC, 2020). However, decreases in heroin and prescription opioid-related deaths were not evident for non-Hispanic Black individuals; rather, opioid-involved overdose death rates increased in this population (CDC, 2020). Moreover, research by Wu and colleagues (2016), using a large and nationally representative sample of individuals with opioid use disorder, found that Black individuals are less likely to receive necessary opioid-related treatment compared to White individuals. Moreover, Black PWID are less likely to receive services from SSPs

than their White counterparts, and SSPs are more likely to be located in areas with a lower percentage of Black residents, potentially reducing their access to THN and other harm-reduction services that SSPs provide (Rowe et al., 2016; Williams & Metzger, 2010).

1.4 THN and race gaps in knowledge and current study

To our knowledge, few U.S. studies have evaluated racial differences in THN possession and administration. Madden and Qeadan (2019) found that among individuals prescribed opioids, Black individuals were less likely to also receive THN prescriptions than White individuals. Similarly, Marino et al. (2019) found that prior to a recent electronic health record prompt intervention, White individuals who experienced an overdose were significantly more likely to be prescribed THN by emergency departments postrelease than non-Whites who also experienced an overdose. Another study by Kenney and colleagues (2018) found that among a sample of treatment-seeking, opioid-dependent individuals, no Black participants administered THN in the past year, versus 15% of White participants, 12% of Hispanic participants, and 33% of participants of other races. However, this study did not assess recent THN possession and could not determine the mechanism through which no Black individuals came to administer THN (Kenney et al., 2018). Ray and colleagues (2020) found that among those who experienced a fatal overdose, Black individuals were less likely to have been administered naloxone by emergency medical services and less likely to have had an overdose event where THN was administered. Similarly, Dayton and colleagues (2020) found that White individuals were more likely to have access to THN and overdose prevention than Black individuals. However, this study did not assess the role of differential engagement in harm reduction services on access and utilization of THN. Thus, we examined racial differences in overdose response training, THN possession, and THN administration among PWID and the role of the SSP in THN possession.

2. Materials and methods

This study uses data from a sample of PWID recruited from Baltimore City SSP sites (N=16) from April to November 2016 (Sherman et al., 2018; Hunter et al., 2018; Park et al., 2018). Study staff approached clients as they exited SSP sites and screened them for eligibility. To be eligible, participants had to be a registered client of the SSP, be 18 years of age or older, reside in Baltimore City, and provide oral informed consent. Additionally, study staff asked clients to refer nonclient peers to the study, who the study also required to be 18 years of age or older, inject drugs, and provide oral consent. Interested and eligible participants then underwent an interviewer-administered computer-assisted personal interview (CAPI) survey. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study.

2.1 Measures

Participants self-reported their race/ethnicity, which we dichotomized as Black or White. Of the 299 participants (204 clients and 95 nonclients), the study excluded individuals who self-identified as any race/ethnicity other than Non-Hispanic Black or Non-Hispanic White due to small sample size (n=26). Of the Black and White participants, a small number

(n=10) were missing key data (e.g., socio-demographic or substance use), and we also excluded them, yielding a final sample size of 263. We categorized study participants as clients or nonclients based on how we recruited them into the study. We then created a 4-level variable denoting race by client status (White SSP clients, Black SSP clients, White nonclients, Black nonclients). Participants self-reported sociodemographic characteristics, drug use, and related practices, whether they currently had THN with them or at their home (yes/no), history of overdose response training (yes/no), and history of administering THN (yes/no).

2.2 Statistical analyses

The study used chi-square analyses to examine bivariate relationships between THN possession and race, SSP client status, other sociodemographic characteristics, witnessing an overdose, and past 30-day drug use. We then conducted a multivariable logistic regression predicting THN possession using all covariates that were significant at the $p < 0.1$ level in the bivariate analyses.

3. Results

3.1 Overall sample characteristics

Among the overall study sample, 61% of the participants were Black, and 39% were White (Table 1). Most were male (70%), SSP clients (70%), insured (81%), and single (67%). Study participants primarily had less than a high school degree or a high school degree (38% and 45%, respectively). In addition, 29% reported an arrest or incarceration in the past year, 29% reported living with friends or family, and 33% reported being homeless. Almost all (88%) had witnessed an overdose, and 38% had witnessed a fatal overdose.

3.2 Bivariate associations with THN possession, overdose training, and THN administration

The majority of participants reported receiving overdose response training (69%) and having THN with them or at home (52%). Of those who had ever witnessed an overdose (N=231), 42% had ever administered THN. Black (80%) and White (76%) SSP clients were significantly more likely to receive overdose training than non-SSP clients, regardless of race (White nonclients 36%, Black nonclients 52%). Significant race by client status differences existed regarding THN possession and administration. Black nonclients were less likely to have THN on them or at home (31%) compared to White nonclients (59%) or Black SSP clients (65%) and White SSP clients (50%). White clients (61%) and Black clients (40%) were more likely to have ever administered THN than White nonclients (22%) and Black nonclients (27%).

3.3 Multivariable logistic regression predicting correlates of overdose training, THN possession, and THN administration

Table 2 summarizes the multivariable logistic regression results for overdose training, THN possession, and THN administration. After adjusting for sociodemographic and drug use variables, Black SSP clients were nearly four times as likely as Black nonclients to have received overdose response training (AOR: 3.85, 95% CI: 1.88, 7.92). Similarly, White

clients were nearly three times as likely to receive overdose response training than Black nonclients (AOR 2.73, 95% CI: 1.29, 5.75). The study found no significant differences in overdose training between White nonclients and Black nonclients. Other significant correlates of overdose training include being in a relationship (AOR 2.04, 95% CI: 1.08, 3.84) and ever witnessing a fatal overdose (AOR 1.86, 96% CI: 1.02, 3.40).

Race and SSP client status were significantly linked with THN possession after controlling for covariates. Compared to Black nonclients, White nonclients (AOR 4.49, 95% CI: 1.50, 13.47) and Black SSP clients (AOR 4.21, 95% CI: 2.00, 8.87) were more than four times more likely to possess THN. White SSP clients were more than three times more likely to possess THN than Black nonclients (AOR 3.54, 95% CI: 1.56, 8.04). Participants who were homeless (AOR 0.34, 95% CI: 0.17, 0.68) or had children (AOR 0.50, 95% CI: 0.27, 0.90) were significantly less likely to possess THN. Participants who were in a relationship were significantly more likely to possess THN (AOR 2.39, 95% CI: 1.30, 4.38). The study found no significant race/client differences in THN administration; the significant correlates were smoking heroin in the past 30 days (AOR 0.52, 95% CI: 0.27, 0.99) and having a high school diploma or GED (AOR 0.32, 95% CI: 0.14, 0.74).

4. Discussion

This study reveals a substantial unmet need for overdose response training and overdose reversal drugs among individuals at high risk of overdosing or witnessing an overdose, as well as the utility of SSP programs in providing overdose training among PWID. While the same percentage of Black and White SSP clients reported having THN on their persons or at home in our sample, Black nonclients were less likely to possess THN than SSP clients and White nonclients. The significant difference between Black and White nonclients in THN possession may in part be attributed to age differences; younger PWID (White participants were younger than Black participants) are more likely to engage in higher-risk injection practices (Roux et al., 2016), thus may be more likely to seek out overdose preventative measures. However, drug overdose deaths for individuals aged 45–54 and 55–64 increased 15% and 17%, respectively, from 2015 to 2016, illustrating the need for targeted interventions for older PWID (Hedegaard, Warner, & Miniño, 2017).

We found no significant race/client differences in the administration of THN, inferring that once participants received THN, they were equally likely to administer it during an overdose. The lack of racial difference in administration also suggests that Black nonclients would likely use THN if received and that the lack of access to THN among Black nonclients likely limits the benefit of overdose prevention strategies in this community.

Current trends on opioid-related deaths illustrate a disproportionate impact on racial and ethnic minorities. Specific to Black individuals, opioid-related deaths increased 25% from 2016 to 2017, with a 61% increase in synthetic opioid-related deaths during the same time frame (Ray et al., 2020). These increases in overdose deaths among Black individuals have been attributed to fentanyl-laced cocaine, though White individuals have a greater past-year and lifetime use of cocaine (Ray et al., 2020), suggesting a need for aggressive harm-reduction approaches among Black individuals who use opioids. In our study, our

results imply that White nonclients had avenues other than SSPs to obtain THN that may not be accessible to their Black counterparts. This finding suggests that SSPs may be especially beneficial for Black PWID in accessing THN and other harm-reduction services. Unfortunately, prior research on SSPs has found that Black PWID are less likely than White PWID to utilize SSPs, even when the location of SSPs are significantly closer to the homes of Black PWID, due to barriers, including police harassment, discrimination, and stigma (Eversman, 2015; William & Metzger, 2010). Interventions to reduce opioid-related health consequences may need to make a concerted effort to address these barriers. In addition, overdose response training and THN distribution should explicitly target organizations that service or are frequented by Black PWID, including a range of harm-reduction organizations, health organizations, hospitals, social services, and churches. SSPs and other community-based harm-reduction programs may be particularly effective avenues to educate clients on safe drug use practices along with dispelling myths that could increase harm among PWID.

4.1 Limitations and strengths

The results of our study should be contextualized within several limitations. We faced a number of sample size limitations in this study, particularly as we stratified by SSP client status and race. We were also unable to study racial/ethnic groups other than White and Black groups due to small sample sizes. We also did not measure previous THN, only current possession. Participants who reported no possession of THN may have previously had naloxone but had already used it. Last, our study findings may not be generalizable to rural SSPs as there may be socio-contextual factors related to access to and availability of THN and overdose response training that differ from urban SSPs. However, research on Baltimore SSPs found that around 69% of participants were male, and 73% were Black, similar to our study sample demographics (Gindi et al., 2009). The current study is one of the first studies to examine engagement in SSPs and racial differences in THN possession and administration and overdose response among PWID. Thus, this study is an important step forward in understanding racial disparities in opioid overdose prevention strategies and the related health disparities they perpetuate.

5. Conclusion

Around 80% of individuals experiencing an overdose do so in the presence of others (Bennett, Holloway, & Bird, 2014); overdose response training and THN presents a significant opportunity to curtail opioid mortality. However, some states lack organizations to distribute THN to laypersons at risk of experiencing or witnessing an overdose (Fairbairn, Coffin, & Walley, 2017; McDonald et al., 2017; Meuller et al., 2015; Wheeler et al., 2015). Even within states that have some THN distribution, limited naloxone supplies, geographic barriers, and other related barriers prevent existing harm-reduction efforts from reaching all people in need (Tobin et al., 2018). As research has raised concerns of equitable access to opioid treatment and THN among minorities, particularly Black individuals (Dayton et al., 2020; Hansen & Netherland, 2016), our results suggest harm-reduction interventions, such as SSPs, may be avenues to foster equal access to preventative measures.

Acknowledgments

Funding: This research was supported by the following National Institute on Health (NIH) grants: K01DA051715 (AA Jones), T32DA007292-24 (KE Schneider), R01DA040488-04S1 (AA Jones), 1K01DA046234-02 (PI: Sean T. Allen), and the Johns Hopkins University Center for AIDS Research, an NIH funded program (P30AI094189)

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Highlights

- This study evaluates differences in overdose response training and naloxone (THN)
- Data came from syringe services program (SSP) clients and non-clients who inject drugs
- SSP clients were more likely to receive overdose training than Black non-clients
- SSP clients and White non-clients were more likely to have THN than Black non-clients
- Engagement in outreach targeting and provided by the target population is needed

Table 1.

Sociodemographic characteristics of people who inject drugs by race and syringe services program client status.

	Total N = 263 (100%)	White n=102 (39%)		Black n=161 (61%)		
		Non-Client n =22 (8%)	Client n =80 (30%)	Non-Client n = 58 (22%)	Client n =103 (39%)	
	n (%)	n (%)	n (%)	n (%)	n (%)	p
<i>Sociodemographic</i>						
Age						
18–44	110 (42%)	19	63	10	18 (17%)	<0.001
45 and older	153 (58%)	3 (14%)	17	48	85 (83%)	
Male Sex						
	184 (70%)	16	47	47	74 (72%)	0.04
Educational						
Less than HS	100 (38%)	8 (36%)	30	23	39 (38%)	0.76
12 th grade or	119 (45%)	11	33	24	51 (50%)	
Some college	44 (17%)	3 (14%)	17	11	13 (13%)	
Housing Status						
Own/Rent	99 (38%)	7 (32%)	20	23	49 (48%)	<.0001
Staying with	77 (29%)	7 (32%)	16	23	31 (30%)	
Homeless	87 (33%)	8 (36%)	44	12	23 (22%)	
In a Relationship						
	88 (33%)	7 (32%)	36	18	27 (26%)	.06
Has Health						
	214 (81%)	17	58	45	94 (91%)	<0.01
Has Children						
	108 (41%)	13	43	26	26 (25%)	<.001
Past Year						
	77 (29%)	4 (18%)	40	9 (16%)	24 (23%)	<.0001
<i>Drug Use in Past 30 days</i>						
Smoked Marijuana						
	109 (41%)	12	36	23	38 (37%)	0.40
Non-Injection						
	136 (52%)	13	57	25	41 (40%)	<.0001
Smoked Heroin						
	85 (32%)	7 (32%)	17	23	38 (37%)	0.08
Injected Heroin						
	239 (91%)	21	77	50	91 (88%)	0.13
Non-medical						
	66 (25%)	1 (5%)	26	19	20 (19%)	0.01
Injected Speedball						
	146 (56%)	6 (27%)	38	33	69 (67%)	<.01
Tranquilizer Use						
	62 (24%)	6 (27%)	26	16	14 (14%)	0.02
<i>Witnessed Overdoses</i>						
Ever Witnessed Any						
	231 (88%)	18	70	49	94 (91%)	0.48
Ever Witnessed						
	100 (38%)	6 (27%)	34	20	40 (39%)	0.55
<i>Take-home naloxone (THN)</i>						
Received Overdose						
	181 (69%)	8 (36%)	61	30	82 (80%)	<.0001
THN Possession						
	138 (52%)	13	40	18	67 (65%)	<0.001
THN						
	98 (42%)	4 (22%)	43	13	38 (40%)	<0.001

Table 2.

Correlates of overdose training and take-home naloxone (THN) possession and administration among Black and White PWID (N=263) in multivariable logistic regressions.

	Model 1 (Overdose Training) AOR (95% CI)	Model 2 (THN Possession) AOR (95% CI)	Model 3 ^{***} (THN Administration) AOR (95% CI)
Male Sex	----	----	0.57 (0.30, 1.08)
Ages 18-44	----	----	1.22 (0.57, 2.59)
Education			
Some College or more	----	----	REF
High School/GED	----	----	0.32 (0.14, 0.74)
Less than High School	----	----	0.45 (0.19, 1.05)
Race/SSP Client Status			
Black non-clients	REF	REF	REF
White non-clients	0.54 (0.19, 1.55)	4.49 (1.50, 13.47)	0.49 (0.12, 2.12)
Black clients	3.85 (1.88, 7.92)	4.21 (2.00, 8.87)	1.93 (0.86, 4.32)
White clients	2.73 (1.29, 5.75)	3.54 (1.56, 8.04)	2.42 (0.91, 6.42)
Housing Status			
Own/rent house/apartment	----	REF	REF
Staying with family/friends	----	0.56 (0.29, 1.08)	0.70 (0.33, 1.48)
Homeless	----	0.34 (0.17, 0.68)	1.68 (0.80, 3.56)
Past Year Arrest/Incarceration	----	0.85 (0.45, 1.61)	----
Current Relationship	2.04 (1.08, 3.84)	2.39 (1.30, 4.38)	1.40 (0.74, 2.63)
Has Children	----	0.50 (0.27, 0.90)	----
Witnessed Fatal Overdose	1.86 (1.02, 3.40)	----	----
Smoked Heroin in Past 30 days	----	0.60 (0.32, 1.15)	0.52 (0.27, 0.99)
Past 30-Day Nonmedical Prescription Pain Medication/Speedball Injection	0.98 (0.52, 1.85)	----	----
Past 30-Day Nonmedical Prescription Pain Medication/Tranquilizer Use	---	0.57 (0.32, 1.02)	----

Note. AOR = Adjusted Odds Ratio

Models include all significant bivariate correlated of Race/SSP Client Status and overdose training, THN possession, and THN administration at p < 0.1

Bolded number indicate significant correlates at the <.05 level

^{***} Sub-sample of 231 participants who have ever witnessed an overdose (94 black clients, 70 white clients, 49 black non-client, 18 white non-clients)

Past 30-Day Nonmedical Prescription Pain Medication/Speedball Injection = Combined variable