

NDEWS Naloxone Substudy: Worcester, MA Characterizing Knowledge, Attitudes, Behaviors, and Practices Related to Bystander Naloxone

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INTRODUCTION

The primary aim of this study by Kavita Babu and her study team was to contextualize if and how drug use patterns and attitudes have changed as a result of the increasing availability of naloxone. Additionally, the aim of this research was to provide information regarding individuals' knowledge of, access to, experiences with, and perceptions of naloxone. Toward these aims, the study investigators piloted the semi-structured interview and survey developed by the National Drug Early Warning System (NDEWS) workgroup with ten participants presenting to the University of Massachusetts Memorial Medical Center Emergency Department (ED) who had a history of nonmedical opioid use.

The topics addressed during this site's semi-structured interviews are listed as follows. Study investigators also provided feedback on implementing these tools within their study population, as well as barriers and facilitators for completion of this protocol within their institution.

Semi-structured interview topics:

1. Knowledge about Naloxone
2. Access to Naloxone
3. Experience with Naloxone
4. Perceptions and Attitudes Toward Naloxone
5. Influence of the Availability of Naloxone on Drug Use Behaviors
6. Participant-initiated Comments and Reflections

A preliminary summary of responses and investigator observations absent a formal qualitative data analysis are provided in this report.

METHOD

Study Design

This is a mixed-methods study of adult patients who presented to the University of Massachusetts Memorial Medical Center ED (Worcester, MA) with an opioid-related chief complaint (e.g., drug overdose, or abscess) and history of nonmedical opioid use. A convenience sample of ten participants was enrolled during the study period (March–April 2019). This protocol was approved by the University of Massachusetts Medical School Institutional Review Board.

Study Setting and Participants

Study investigators obtained a HIPAA Waiver of Authorization to query the ED tracking board for potential participants. Once the patient had been evaluated, treated, and deemed medically stable by the treating provider, study staff approached him or her to offer participation in this study.

Eligible Participants

All eligible participants 1) were 18–65 years of age; 2) presented to the ED with an opioid-related chief complaint; 3) had a history of nonmedical opioid use; 4) were English-speaking; and 5) were able to provide informed consent. Individuals were excluded if they had previously participated in this study or were in police custody. Participants were compensated for their time with a \$10 gift card to a local retail store.

Data Collection and Handling

Verbal consent was obtained from participants. Interviews and survey administration were conducted in private rooms within the ED and lasted up to 30 minutes. Semi-structured interviews, which contained open-ended questions regarding naloxone, were audio-recorded on a study-designated digital voice recorder and transcribed using a HIPAA-compliant transcription company or trained study staff member.

After the interview, study staff verbally administered the survey and recorded participant responses. The survey comprised demographic questions and a series of closed-ended statements to which participants were asked to respond using a Likert scale.

To ensure that there were no duplicate enrollments, participant names and medical record numbers were recorded on a master code and retained until the completion of enrollment. All study data were coded with a randomly generated study identification (ID) number, and transcribed interviews were reviewed to ensure they did not contain any identifying information. The master code was the only place identifying information was temporarily linked with the study ID number. All relevant coded data were entered into Research Electronic Data Capture (REDCap), a secure Web-based application for building and managing online surveys and databases (Harris et al., 2009). As an additional layer of protection, a Certificate of Confidentiality was obtained from the National Institutes of Health.

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DEMOGRAPHICS (N = 10)

Median age, years (range)	33 (20–56)
Sex, <i>n</i>	
Male	8
Female	2
Race and ethnicity, <i>n</i>	
White, non-Hispanic or Latino	8
Native Hawaiian or Other Pacific Islander, Hispanic or Latino	1
Multiracial, non-Hispanic or Latino	1
Married or have significant other, <i>n</i>	
Yes	5
No	5
Number of children, <i>n</i>	
None	5
1–2	3
3+	2
Highest level of education completed, <i>n</i>	
Less than high school	1
High-school diploma or equivalent	1
Some college, no degree	5
Associate degree	3
Primary employment status (past 12 months), <i>n</i>	
Unemployed	2
Employed full time	3
Student	1
Employed full time and student	1
Retired/disabled	3
Primary housing situation (past 12 months), <i>n</i>	
Homeless	2
Apartment	3
House	3
Sober living house	2
Chief complaint, <i>n</i>	
Suspected opioid overdose (naloxone administered)	4
Other opioid-related chief complaint	6
Received naloxone (lifetime), <i>n</i>	
Yes	8
No	2
Been in treatment for substance use (lifetime), <i>n</i>	
Yes	10
No	0
Number of prior drug-related ED encounters (lifetime), <i>n</i>	
None	2
2–5 encounters	5
6+ encounters	3

SUMMARY OF FINDINGS

1. Knowledge About Naloxone

- A. All participants were familiar with the term “Narcan[®],” but some were not familiar with the term “naloxone”:
- One individual mistook naloxone for naltrexone.
 - A single participant had never heard the term “naloxone” before.
- B. Most participants reported first hearing about naloxone through treatment programs (e.g., detox or Alcoholics Anonymous meetings) or correctional facilities, from other people who use opioids for nonmedical purposes, and “when they saved my life for the first time.” Two participants informed study staff that they could not recall how they first learned about naloxone because they had “known about it for so long.”
- C. Most participants understood the general purpose of naloxone, yet there were varying degrees of coherence about the exact underlying mechanisms. The majority of participants used specific terminology implying blockade or antagonism when describing how naloxone works (e.g., words like “receptor,” “blocker,” and “reversant”). Most participants identified naloxone’s specificity for opioids, but two participants also questioned its utility for other substances, such as alcohol.
- Used the term “receptors” ($n = 5$):
 - “It encases the receptors; or blocks your receptors from taking any known drug in.” – ND01
 - “It blocks the receptors in your brain.” – ND02
 - “Something with the receptors to fill them instead of the opiate.” – ND04
 - “It basically pulls the opiate out of the receptor.” – ND05
 - “It reverses the receptors in your brain so no opiates latch onto your opiate receptors.” – ND08
 - Described naloxone as being a “blocker” ($n = 4$):
 - “It blocks what’s happening for a period of time in your body, and after a certain period of time, you’re still probably gonna get the same effect that you got in the beginning.” – ND01
 - “It’s an opiate blocker.” – ND02 and ND09
 - “It’s a blocker to the pleasure sensors.” – ND03
 - Described naloxone as a reversal agent that brings someone back ($n = 6$):
 - “It reverses the effects of an overdose.” – ND01

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- “It’s a reversant of heroin overdose.” – ND03
 - “It’s supposed to revive you and bring you back from what could possibly be death.” – ND06
 - “It brings back somebody from an overdose.” – ND07
 - “It reverses the effects so it can bring the person back to life.” – ND08
 - “It works for opiates and helps to revive somebody from an overdose.” – ND10_
- Additional quotes containing uncertainty or misinformation about naloxone:
- “I think that’s all it does is block opiate. I don’t know about alcohol.” – ND02
 - “Before they had Narcan, they had adrenaline. They take a big needle and jab it in your heart. They came out with Narcan to make it a little easier.” – ND02
 - “I know it’s definitely for heroin but I heard you could use it for other things” – ND06
- D. All but one participant reported that they currently or previously possessed a naloxone kit. Of those nine, three participants reported their reasoning for carrying a kit was to save the lives of others:
- “If someone needed it, I would rather have it than be powerless.” – ND02
 - “If I was using with people that tended to nod out, yeah [I would make sure I had a kit].” –
 - ND09
 - “I want to help others; I’m not walking around with that just for the hell of it; I’m gonna try to save a life.” – ND10
- E. The majority of participants reported obtaining naloxone kits that contained the newer “easy” plunger-style nasal sprays in Massachusetts. Some participants mentioned that they had previously obtained the more “difficult to use” older version that required assembly:
- “The newer ones are really simple, but with the ones they put together, I’d have no idea [how to administer it].” – ND04
- F. Nine participants expressed some understanding of the Good Samaritan Laws but there was variation in comprehension about what the laws cover. Several participants also expressed concern over whether police would adhere to these laws. One participant reported that they had never heard of these laws:

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- “It’s if- if you get caught with somebody, if-if they’re both high and you... are using, and he is using, they can’t arrest you.” – ND01
- “Trust me, the cops don’t follow the Good Samaritan law. They don’t have to. ... They’re supposed to, but it doesn’t mean they do.” – ND09

2. Access to Naloxone

- A. Participants universally agreed that naloxone kits were available and easy to obtain from a variety of organizations (e.g., pharmacies and treatment facilities). All participants knew the process for obtaining a naloxone kit, and many reported obtaining it from a harm-reduction agency (e.g., needle exchange) that distributed it for free and provided training:
 - “I get it for free, I never paid one dollar for it. There’s plenty of programs that give it out for free.” – ND09
 - “It’s not hard to get, so no excuse. Nothing to prevent them from getting it. You could go get it for free.” – ND10
- B. When asked how programs that distribute naloxone could improve their services, some participants suggested increasing access by providing it whenever someone visits a needle exchange, leaves a treatment program, and by implementing mobile programs of outreach workers within the community:
 - “Having more street teams [to distribute Narcan]. Say, uh, EMS, the nurse practitioners, police teamed up.” – ND03

3. Experience With Naloxone

Experience being revived:

- A. Many participants reported experiencing unpleasant physical responses consistent with opioid withdrawal (nausea, vomiting, severe body pain) when being revived with naloxone. One participant acknowledged that this was the worst pain he had ever experienced:
 - “It’s instant withdrawal, but the worst withdrawal you ever felt in your life. Like you feel like your legs are broken, your head’s screaming.” – ND05
- B. When participants were asked whether they had any emotional response to being revived with naloxone, several disclosed that they felt embarrassed or experienced feelings of depression/anxiety:
 - “[After overdosing I felt] not too well because I’ve had it happen before. Kind of embarrassing and degrading and you know it’s upsetting.” – ND09
 - “[After receiving Narcan I felt] like you do in withdrawals. You know it’s

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almost the same feeling, the depression, anxiety, all that stuff.” – ND05

- C. Participants acknowledged that receiving naloxone is a severely traumatic experience that they would go to great lengths to avoid. In the event that they were to overdose and require naloxone to save their life, however, they hoped someone would administer it:
- “Narcan is painful but it’s good ... when you get Narcan it hurts.” – ND05
 - “Nobody wants to be Narcan’d.” – ND05
 - “[When receiving Narcan for an overdose] it’s better to feel the pain then die.” – ND05
 - “I think [Narcan]’s a life-saver. I mean it saved my life numerous times.” – ND08
- D. Several participants reported that they had recently relapsed, but none identified naloxone availability as playing any role in their decision to return to drug use.
- E. None of the participants had ever self-administered naloxone or knew of anyone who had. All believed that it was impossible or very difficult to do so when indicated.

Experience reviving others:

- F. Participants described several perceived barriers when speculating why someone would not administer naloxone. These included fears of legal repercussions, naloxone not being readily available, and not wanting to interrupt the individual’s euphoric experience (“high”). Additionally, participants reported an aversion to carrying naloxone as a sign that their recovery might not be successful:
- “Say you needed Narcan, and I was gonna be the one to give it, maybe I'd be hesitant ‘cause I'm like, “I don’t know, I don’t wanna ruin his high.” – ND02
- G. Most participants identified cyanosis as the major indicator to administer naloxone.
- H. All participants reported having formal naloxone training with sites including local treatment facilities and harm reduction organizations.

General comments:

- I. Several participants stated that they had heard of or had seen others using heroin/fentanyl immediately after being revived with naloxone to mitigate withdrawal symptoms. One participant reported doing this herself all the while noting that this was “messed up”:
- “[For] some people, [overdosing is] traumatic and probably sends them in another direction. But most people just can’t wait to get out [and use] again.” – ND03

— “Now you have someone who’s sick who wants your dope. ... So they’re not highly regarded” – ND09

- J. When asked how individuals who had been revived by naloxone were thought of by other opioid users, many participants responded by saying they were “lucky.” Some participants stated that they have themselves felt lucky after being revived with Narcan.

4. Perceptions and Attitudes Toward Naloxone

- A. Several participants perceived naloxone as a life-saving drug and were thankful for its presence within the community:

— “[I] think it’s an amazing drug. I seen it save people’s lives.” – ND09

— “[Narcan is] probably the best tool to have. It’s the best tool to use.” – ND08

- B. When asked the question “How do dealers think about naloxone?” many participants laughed and responded by saying that they do not think about it because user safety is not a primary concern for them. One participant did however report that a dealer might encourage users to seek naloxone to ensure they still have a clientele to sell to.

- C. Some participants reported feeling empowered by carrying naloxone and said they would use it to revive someone:

— “I carry it all the time. ... You could probably walk to the corner and you always see someone out. ... If someone needed it, I would rather have it than be powerless.” – ND02

5. Influences of the Availability of Naloxone on Drug Use Behavior

- A. Participants all agreed that their decision to use opioids was not at all dependent on whether they had naloxone available:

— “It’s not like we use heroin because we have naloxone. ... I’ve never seen anyone that wouldn’t already do heroin, do heroin because they have naloxone.” – ND09

- B. All participants speculated that other opioid users might adopt riskier drug use behavior because of the availability of naloxone, such as taking bigger doses or using more often. In stark contrast, all participants explicitly denied that they themselves engaged in riskier behavior and/or altered their opioid use in any way as a result of the availability of naloxone.

- C. Participants reported using in groups as a harm reduction strategy:

— “But now it’s like—you shoot alone, chances are you’re gonna die.” – ND03

— “Maybe people are using more in groups now because obviously they’re not going to administer naloxone on their dead body.” – ND01

6. Participant-initiated Comments and Reflections

- A. Most participants shared the belief that the majority/all of the current “heroin” supply is fentanyl. Fentanyl was described as less desirable because it 1) is perceived as more dangerous and 2) is shorter-acting than heroin, requiring more frequent dosing:
- “I’ve been really scared before, where, um, fentanyl like makes you feel like you’re gonna die sometimes.” – ND04

Findings on Using the Naloxone Likert Questionnaire, Recommendations, & Modifications

The naloxone Likert questionnaire was introduced to all ten participants, one of whom refused. Of the nine that attempted this questionnaire, one individual only answered four questions before giving up due to frustration. The questionnaire itself was first given to the participant to fill out. It became apparent, however, that participants did not want to fill out the questionnaire but preferred to have it read to them. They were then given a visual aid (sheet of paper with the numbers and the corresponding agreement/disagreement levels).

The facilitator would read the statement, and the participants would provide their numerical answers. The participants would frequently ask the facilitator to re-read the statement or would say that they did not understand what the statement was implying. The facilitator would then attempt to rephrase the statement, but often he or she still felt that there was a lack of understanding from the participant, leading the participant to choose the neutral response, three. In other cases, facilitators felt as though the participants would provide the response that they thought was anticipated or desired by the interviewer. Several participants became visibly frustrated while completing the questionnaire and would state that the questions were confusing or repetitive.

We would caution interpretation of these data. We did note, however, that our participants disagreed that people with naloxone kits are more likely to take opioids (no Level 4 or 5 agreement scores reported), and that our participants disagreed that they would be able to self-administer naloxone (no Level 4 or 5 agreement scores reported).

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	1 Don't agree at all	2	3	4	5 Strongly agree	Number of responses
People who have naloxone kits are more likely to take opioids (for example: oxycodone (Roxicet, Percocet), codeine, methadone, buprenorphine (Suboxone), heroin).	22.2%	33.3%	44.4%	0%	0%	9
People who have naloxone kits are more likely to take bigger doses of opioids than they would if they didn't have the kit.	33.3%	0%	44.4%	11.1%	11.1%	9
People who have naloxone kits are less likely to take bigger doses of opioids than they would if they didn't have the kit.	33.3%	11.1%	33.3%	22.2%	0%	9
People who have naloxone kits are more likely to use opioids safely without risking overdose.	22.2%	11.1%	22.2%	11.1%	33.3%	9
If I know that there is a naloxone kit nearby, I feel safer when I use opioids.	0%	12.5%	12.5%	25.0%	50.0%	8
When I have naloxone available, I am more likely to use opioids.	37.5%	0%	37.5%	25.0%	0%	8
When I have naloxone available, I am more likely to take bigger doses of opioids.	25.0%	12.5%	25.0%	12.5%	25.0%	8
When I use opioids alone and have naloxone, I feel more confident about my safety.	50.0%	25.0%	12.5%	12.5%	0%	8
If I used too much opioids, I would be able to administer naloxone on myself before I lost consciousness.	62.5%	12.5%	25.0%	0%	0%	8

Study Staff Reflections on the Semi-structured Interview, Challenges to Implementation, and Recommendations for Modifications

This is a lengthy interview agenda for patients in the emergency department, particularly for those patients who presented after a near-fatal overdose. We anticipate that streamlining the agenda would not be difficult and would still allow for questions regarding the primary areas of interest.

CAVEATS AND LIMITATIONS

Our sample size ($N = 10$) was small and unlikely to be sufficient to determine thematic saturation. Additionally, several groups were overrepresented (e.g., male and White). We were unable to administer this interview in Spanish, excluding several otherwise eligible potential participants. As detailed earlier, the Likert instrument was poorly received by our patient population, and the results must be considered in that context.

CONCLUSION

Overall, our group found that the qualitative agenda created by the NDEWS working group allowed us to answer the questions set forth at the inception of this study. At our site, we found that participants at our site ($N = 10$) did not increase their use of opioids because naloxone was available. In fact, we found that the aversion to naloxone led to some participants reporting less drug use out of fear of precipitated withdrawal. Additionally, we found widespread acceptance of, knowledge of, and willingness of our participants to use, naloxone. We look forward to completing our detailed analysis of these data and sharing that information with the NDEWS team.

REFERENCE

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support, *Journal of Biomedical Informatics*, 42(2), 377–381.