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Best Practices for A Novel EMS-Based Naloxone Leave Behind Program

Becca M. Scharf, MSc[a,b*], David J. Sabat, MA, NRP[a], James M. Brothers, MS, CRNP, NRP[a], Asa M. Margolis, DO, MPH, MS[a,c], and Matthew J. Levy, DO, MSc, NRP[a,c]

[a]Howard County Department of Fire and Rescue Services, Marriottsville, MD, USA;

[b]Department of Public Policy, University of Maryland, Baltimore County, Baltimore, MD, USA;

[c]Department of Emergency Medicine, Johns Hopkins University, Baltimore, MD, USA;

*Corresponding Author: Becca Scharf, 2201 Warwick Way, Marriottsville, MD 21104, 410-313-5936, bscharf@howardcountymd.gov; becca1@umbc.edu

Abstract

Background: Increasing naloxone access has been identified as a primary strategy to reduce opioid overdose deaths. To supplement community naloxone training and distribution access points, EMS systems have instituted public safety-based naloxone leave behind (NLB) programs that allow emergency medical responders to distribute "leave behind" naloxone kits on the scene of an overdose. This model presents an opportunity to expand naloxone access for individuals at high risk for future overdoses. **Objectives:** To evaluate the preliminary outcomes of a novel EMS-based NLB program in Howard County, Maryland. **Methods:** This exploratory study involved analysis of data from the Howard County NLB Program. Basic statistical analysis of program performance metrics and participant demographic characteristics were performed. **Results:** From June 2018 to June 2019, Howard County Department of Fire and Rescue Services responded to 239 overdose calls and distributed 120 naloxone kits to individuals on the scene of an overdose, a 50.21% distribution rate. The HCNLB program connected 143 patients (59.83%) to peer recovery

specialists. Among the 143 patients linked to peer recovery support specialist services, 87 (60.84%) had accepted an NLB kit from EMS. The fully adjusted logistic regression model revealed that those whose kit was left with a family member on the scene were 5.16 times more likely to be connected to peer support specialists (OR = 5.16, CI= 2.35 – 11.29, p=0.000) while those whose kit was left with a friend or given directly to the patient were 3.69 times (OR=3.69, CI= 1.13 – 12.06, p<0.05) and 2.37 times (OR=2.37, CI= 1.10 – 5.14, p<0.05) more likely, respectively, to be connected to follow up services as compared to those who did not accept a kit, controlling for other variables in the model. **Conclusion:** This study highlights the importance of engaging an individual's family and social network when offering connections to treatment and recovery resources. NLB initiatives can potentially augment existing community-based naloxone training structures, thus widening the scope of the life-saving drug and reaching those most at risk of dying from an opioid overdose.

Keywords: opioids; overdose; naloxone; emergency medical services; overdose prevention

Introduction

The opioid epidemic is a national public health crisis that continues to have widespread consequences for families and communities across the country. In 2017, drug overdoses accounted for more than 70,000 deaths, nearly 68% of which involved an opioid (1). This trend has increased dramatically in recent years with a reported 345% increase (from 9,489 to 42,245 deaths annually) in the number of opioid-related deaths between 2001 and 2016 (2). Current data from the National Institute on Drug Abuse show that from 2002 to 2017 there was a 22-fold increase in the national mortality rate involving synthetic opioids (from 1,295 deaths to 29,406 deaths) (1). Further, lethal overdoses from synthetic opioids represented more than 59% of all opioid-related deaths in 2017, while those from heroin accounted for 32% of the opioid-related mortality in the same year (2, 3).

Increasing access to naloxone, especially for individuals at a heightened risk for overdose, has been identified by local, state, federal, and international agencies as a primary strategy to reduce opioid overdose deaths (4-6). Naloxone is an opioid antagonist that reverses the effects of an opioid overdose and has been shown to be safe and effective for use by both medical professionals and lay persons (7-10). Naloxone has been the standard treatment for opioid overdoses among emergency medical services (EMS) and medical professionals around the world for more than 40 years. However, it is often the case that that systemic barriers, such as delays in overdose recognition and activation of the 911 system, cause first responders to arrive too late to revive overdose victims (4, 7, 8). Community-based overdose prevention interventions have been successful in educating and empowering non-medical bystanders on harm reduction strategies and how to deliver naloxone quickly while awaiting the arrival of EMS, increasing the chances of successfully reversing the overdose effects (4-9).

Current naloxone distribution frameworks provide community-based overdose education training in a variety of settings including health departments, pharmacies, community centers, schools, and emergency departments (11). To supplement these access points, some EMS systems have instituted public safety-based naloxone leave behind (NLB) programs that allow emergency medical responders to distribute “leave behind” naloxone kits on the scene of an overdose. This model offers naloxone kits directly to individuals who have experienced a nonfatal overdose, or their social networks, immediately after the overdose event, presenting a distinct opportunity to ensure naloxone is readily available to those in the community at the highest risk of experiencing or witnessing an opioid overdose (12, 13).

Background

The Opioid Epidemic in Maryland

Like many other states across the country, the opioid epidemic is a serious public health challenge in Maryland, as overdose deaths have risen steadily in the state since 2010 (14). Maryland is among the top five states with the highest rates of opioid-related overdose deaths, with mortality rates consistently ranging from 1.3 to 3 times higher than the national average since 1999 (15). Howard County, Maryland has been particularly impacted by the epidemic, experiencing more than a 13% average increase in opioid-related overdose deaths from 2007 to 2017 (14). Further, in alignment with national and state-wide trends, Howard County saw an estimated 127% increase in fentanyl related overdose deaths from 2015 to 2017 (14). To address this growing epidemic, Howard County and the state of Maryland have taken various actions to expand public naloxone access and improve pathways to addiction treatment and recovery services.

On March 1, 2017 Governor Larry Hogan declared a state of emergency in response to the opioid crisis, making Maryland one of the first states in the country to take such an action (16, 17). The declaration dedicates an additional $50 million in funding over a 5-year period to address the crisis and enables "increased and more rapid coordination between state and local jurisdictions" (16). In addition to the state of emergency, Maryland has enacted various pieces of legislation, amended Good Samaritan laws, and implemented public naloxone access regulations in attempts to combat the opioid epidemic (18).

The Maryland Institute for Emergency Medical Services Systems approved an innovative EMS naloxone leave behind policy for emergency medical responders across the state in March 2018. This optional protocol includes a standing order that allows EMS clinicians to leave

naloxone kits with overdose patients and/or their families while on the scene of an overdose. This promptly connects individuals who use opioids and their families with immediate access to life-saving naloxone kits and substance use disorder recovery resources in the community. Howard County, Maryland was one of the first jurisdictions in the state to implement this novel naloxone leave behind program to help address the opioid epidemic. This manuscript describes the implementation and experiences of the Howard County Naloxone Leave Behind Program (HCNLB). The results from this study will offer exploratory evidence of the potential role of EMS-based naloxone distribution programs as a pathway to providing naloxone to those in the community at the highest risk of opioid overdoses, as well as the ability of such programs to connect participants to additional opioid treatment and recovery resources.

Program Strategy and Implementation

The HCNLB program was implemented on June 4, 2018 and aims to leave naloxone kits with every patient (or their immediate family) who experiences a nonfatal overdose in the county. The initiative is the embodiment of a partnership between the Department of Fire and Rescue Services, which is responsible for distributing kits to individuals on the scene of an overdose, and the Howard County Health Department, which provides the naloxone kits for distribution and the follow-up services with Peer Recovery Support Specialists (PRSS) for those who are interested.

The health department PRSS are individuals who are further along in recovery from substance use or co-occurring mental health disorders and use their lived experience of recovery, as well as skills learned in formal training classes, to help others become and remain engaged in the recovery process. The PRSS's first-hand experience with substance abuse and/or mental illness increases their credibility and promotes trust with those they work with. Their role is to

offer support, give those new to the program a sense of belonging within the community, and create healthy social networks. They also share information about recovery skills as well as services, resources, and supports available in the community.

After treating a patient experiencing an opioid overdose or related call, in accordance with Maryland Medical Protocols, the EMS clinicians on scene then offer the patient a leave behind naloxone kit. The naloxone kit's contents are outlined in Table 1. The educational pamphlets included in the kit contain information on identifying signs and symptoms of an overdose, actions to take in the event of an overdose, and just-in-time instructions for naloxone use. In addition to the contents outlined in Table 1, the leave behind kits include the Howard County Health Department's contact information for those who wish to obtain another kit or information on available treatment and recovery resources. Leave behind kits are stocked on all front-line ambulances and medical supervisor vehicles, which also restock kits as needed.

Kits may be left with the patient, their family members, or cohabitants at the scene, regardless of whether the patient is transported to the hospital. If the kit is refused, EMS clinicians must document the reason for refusal. When a kit is accepted at the scene of an overdose, the EMS clinicians obtain the best possible phone number for future follow-up by a health department PRSS with the patient. A kit will still be left if the patient refuses to provide a phone number.

Health department PRSSs are notified after a kit is left on the scene of an opioid-related event, with instructions to reach out to the individuals within 24 to 48 hours to offer connections to treatment and recovery services. The PRSS can also be notified through an "on-call" number for urgent situations such as an indication of readiness for treatment in that moment. In these instances, the PRSS can meet the patients at the hospital to offer immediate follow-up services.

Proper documentation is paramount to ensure continuous quality improvement and data tracking of the program. Accordingly, EMS clinicians complete the standard electronic patient care report, as well as additional questions related to the naloxone leave behind kit. These questions ask if a patient accepted a leave behind kit, if a follow-up contact number was obtained, if the patient was transported to the hospital, and the relation of the individual who received the kit to the patient.

Methods

Study Design

This study consisted of a retrospective analysis of data from the Howard County Naloxone Leave Behind Program. The goal of this study was to evaluate the initial project outcomes and challenges from the first year of program operation. The population of interest included adult residents of Howard County (≥18 years) who experienced a nonfatal overdose. All patient information was de-identified prior to analysis to protect the privacy and confidentiality of the individuals' health information. Written consent was not obtained as this was a secondary analysis of existing program data and there was no contact with study participants by the investigators. This study was reviewed and approved by the Johns Hopkins University Institutional Review Board (Baltimore, Maryland, USA).

Data Collection and Processing

The data for this study were collected as part of medical record keeping for the HCNLB Program, documenting each patient's information and their progress in the program. Access to the HCNLB program data was granted by the Howard County Department of Fire and Rescue Services (Marriottsville, Maryland, USA). Data obtained from the HCNLB records include de-

identified patient demographics, naloxone kit distribution information, ambulance transport data, and linkage to PRSS for future follow-up services for 239 nonfatal overdose patients seen by the program from June 2018 to June 2019. One case was excluded from the study because of missing data resulting in a final sample size of 238 cases. Data cleaning consisted of systematic recoding of dichotomous variables to facilitate analysis as well as the correction of typos and spelling errors.

Outcome Measures

The primary outcome measure was the proportion of naloxone leave behind kits distributed to nonfatal overdose patients or their relations who were present on-scene in the first year of the program. Nonfatal overdose cases were defined as individuals treated in the prehospital setting for opioid overdose as indicated in the responding EMS clinician's report. Nonfatal overdose patients included those who received naloxone on-scene either from a bystander, first responder, or EMS clinician. Secondary outcome measures consisted of the proportion of patients who were connected to PRSS, how often a follow-up contact phone number was obtained on-scene, and who the kits were distributed to in terms of their relation to the overdose victim.

Primary Data Analysis

Statistical analyses were performed using Stata 15 (19). For all analysis an $\alpha = 0.05$ level of significance was used. Frequency tabulations and descriptive statistics were used to assess program performance metrics. Multivariate logistic regression models and chi square tests were conducted to assess the association between age, sex, race, transport status, and acceptance of a leave behind kit. These models were further applied to investigate the relationship between the variables listed above and the likelihood of connection to PRSS.

Results

Characteristics of Study Sample

The final HCNLB sample consisted of 238 nonfatal overdose patients encountered in the first year of program operations. 178 (74.79%) patients attended for a nonfatal overdose were male, while 60 (25.21%) were female. Most patient's races were recorded as non-Hispanic White (149, 62.61%), 29 (12.18%) as African American, 5 (2.10%) as Asian, 6 (2.52%) as Hispanic, 6 (2.52%) as 'other' race, and 43 (18.07%) were reported as 'unknown'. The average age of HCNLB patients was 38 years (SD =12.45) and ages ranged from 18 to 72 years. Sample characteristics are further summarized in Table 2 below.

Naloxone Kit Distribution Results

From June 2018 to June 2019, Howard County Department of Fire and Rescue Services responded to 238 overdose calls and distributed 120 naloxone kits to individuals on the scene, a 50.42% distribution rate. Nearly half of kits (47.5%, 57) were distributed to the patient's family members, while 36.67% (44) of kits were handed directly to the patient. An additional 14.17% (17) were given to a friend who was present at the scene and 2 (1.66%) kits were distributed to an unknown relation. A contact number was obtained an average of 69.75% (166) of the time and in 79.52% of cases, that phone number was viable for follow-up communications. 81.51% (194) patients were transported to the hospital, whereas 18.40% (44) patients refused transport.

Analysis of kit distribution by gender revealed that fewer kits were distributed to women (34, 28.33%) than to men (86, 71.67%). While these proportions differed descriptively by sex, a chi square test indicated no statistically significant association between gender and kit distribution ($p>0.05$). Additionally, chi square tests of kit distribution by race revealed that, though kit distribution was not statistically significantly different between most of the race

categories, there was a significant difference found in kit distribution among African American patients ($p<0.05$) and those whose race was reported as 'unknown' ($p<0.05$) as compared to other groups. Chi square and Fisher's exact tests of the association between kit distribution and age categories found that only the 55 to 64 years age category experienced a significant difference in kit distribution (Fisher's exact = 0.013). Multiple logistic regression analysis of the above factors revealed that age, gender, race, and transport status were not statistically significant in predicting kit distribution. A correlation matrix revealed notable multicollinearity between relation of the kit recipient and kit distribution, therefore these variables were omitted from this portion of the analysis.

Connection to Peer Recovery Support Specialist Results

The HCNLB program connected or attempted to connect 143 patients (60.08%) to health department PRSS, regardless of naloxone kit acceptance. Among the 143 patients linked to PRSS services, 87 (60.84%) had accepted an NLB kit from EMS clinicians while 56 (39.16%) did not accept a kit on scene. Connection to PRSS Descriptive statistics and chi square results are summarized in Table 3. Gender, race, and transport status were not statistically significantly associated with connection to peer support specialists. Chi square analysis illustrated a statistically significant association between the 45 to 54 years age group and connection to PRSS ($p<0.05$). While chi square tests revealed that PRSS connection was not statistically significantly different between most of the recipient relation categories, there was a significant association found in peer recovery specialist connection among those whose kit was given to a family member ($p=0.001$) and among those who did not accept a kit ($p<0.05$).

Multivariate logistic regression analysis was conducted to estimate the ability of age, gender, race, relation of the kit recipient to the overdose victim, and transport to the hospital in

predicting connection to PRSS. Table 4 shows unadjusted and adjusted odds ratios predicting connection to PRSS. The fully adjusted model found the association between kits left with a family relation and connection with PRSS remained significant, controlling for other variables in the model. Those whose kit was left with a family member on the scene were 5.16 times more likely to be connected to peer support specialists compared to those did not accept kits (OR = 5.16, CI= 2.35 – 11.29, p=0.000), controlling for other variables in the model. Additionally, those whose kit was left with a friend were 3.69 times more likely to be connected to PRSS (OR=3.69, CI= 1.13 – 12.06, $p<0.05$) while those whose kit was given directly to the patient were 2.37 times more likely to be connected to follow up services as compared to those who did not accept a kit (OR=2.37, CI= 1.10 – 5.14, $p<0.05$).

Discussion

Principal Findings

This study highlights the importance of engaging an individual's family and social network when offering connection to treatment and recovery resources. Overdose patients whose naloxone kits were provided directly to family members on the scene experienced 5.16 times higher odds of being connected to health department PRSS as compared those who did not accept a kit, while those whose kits were given to friends or directly to the patient experienced 3.69 and 2.38 times higher odds of PRSS engagement, respectively. These findings illustrate not only the success of the program at distributing naloxone to vulnerable community members, but also indicate that distributing a kit to anyone on scene is more effective at increasing connection to PRSS than not distributing a kit at all.

These results align with previous research which has shown that "evidence-based interventions targeting family members of individuals with SUDs [substance use disorders] have

been shown to improve health outcomes for all family members, result in better addiction treatment outcomes, and prevent adolescent, substance use" (20). Further, an early study by Pollini et al. investigating the circumstances leading to drug treatment seeking in a population of injection drug users in Baltimore, Maryland, found that family members were the most commonly cited source of treatment information among study participants; those who spoke specifically with spouses were more likely to seek treatment (21). Thus, NLB initiatives offer a distinct opportunity to educate family members and friends of overdose victims about naloxone use and available recovery resources, which may assist them in promoting engagement in addiction treatment and support sustained recovery for their loved ones.

The outcomes of this study also point to specific age groups and kit distribution strategies which may increase the reach of the HCNLB program and the PRSS. Among HCNLB program participants, kit distribution was most highly associated with the African American racial group and the 55 to 64 years age group. The observed differences in kit distribution by age and race are consistent with findings from previous research. African Americans have consistently been found to experience a disproportionate burden of opioid overdose mortality compared to other racial groups while recent studies have shown an increasing prevalence of opioid misuse among adults aged 50 years and older (22, 23). These findings indicate that the HCNLB program model may be an effective means of engaging and educating particularly vulnerable groups on harm reduction strategies like community naloxone use and peer recovery support resources.

Naloxone distribution programs operate under the principles of harm reduction, which aims to reduce the negative consequences of drug use and other risky behaviors (24). Opponents of harm reduction initiatives argue that increased public naloxone access could potentially lead to increased opioid use because people will rely on naloxone to rescue them from a life-

threatening overdose. On the contrary, evidence has shown that community education and naloxone trainings are associated with reduced fatal overdoses, reduced opioid use, and increased access to treatment and recovery services (7-10, 12, 25). Naloxone access is one piece of the larger puzzle that must consist of rapid treatment referrals, access to medication assisted therapy, and other long-term recovery strategies. However, for an individual to access these services in the future, they must be kept alive, thus naloxone access and distribution programs are an essential component to any opioid overdose chain of survival.

Lessons Learned

From the first year of operation, it appears that both patients and their families are receptive to receiving take home naloxone kits from EMS on the scene of an overdose. Most individuals who have accepted kits from the HCNLB program thus far have been a family member or friend of the individual who overdosed. This aligns with current knowledge and naloxone kit distribution practices, which target the immediate social network of individuals who use opioids as they are more likely to witness and respond to an overdose (10-13, 20, 21). Further, the HCNLB program delivers naloxone to individuals who may not have a way to attend community-based trainings, thereby increasing the access to the life-saving drug for those at the greatest risk of overdose.

Another significant success of the HCNLB program has been fostering and solidifying an already strong collaborative interorganizational partnership between the Department of Fire and Rescue Services and the Howard County Health Department PRSS team. This aspect of the HCNLB program creates a reliable pathway to potentially access treatment and recovery services for those who have experienced a nonfatal overdose, as well as crucial peer support networks who can facilitate a road to recovery if accepted. Further, this collaboration allows each

organization to leverage the other's resources to enact the most efficient and effective community health initiatives while reducing duplication of services between the agencies.

Several challenges arose in the early stages of HCNLB initiative including documentation difficulties, EMS clinician and community buy-in, and barriers to follow-up. Obtaining a valid contact number for follow-up is a fundamental component of the leave behind program in order to connect the patient with a PRSS and recovery resources. Unfortunately, many individuals who are not interested in follow-up will provide a false phone number or may refuse to provide any contact information at all. Some patients may be hesitant to do so out of fear of police involvement and an inadequate understanding of the peer recovery support follow-up program, despite legal protections afforded by Maryland law.

Another challenging component of documentation was standardizing record keeping between the health and fire departments as each operates in their own patient documentation environment, systems which may not be designed to share information from one to the other. This obstacle was addressed by creating a secure shared database that can be accessed by the necessary health and fire department staff, ensuring consistent documentation of patient interactions and follow-ups. This database conforms to all HIPAA and regulatory requirements for the protection of patient information and enables asynchronous communication between the partnered entities.

EMS clinician buy-in and support was a notable barrier in the initial phases of the HCNLB initiative. As this model relies upon first responders to distribute naloxone, the program's success depends upon obtaining widespread support amongst prehospital clinicians. Specific barriers encountered included clinicians who were uncomfortable with leaving a kit behind, did not obtain adequate follow-up contact information, or inadequately documented

interactions when providing a kit after the completion of patient care. Compassion fatigue and cumulative stress are possible contributing factors to these barriers; however, additional evaluation of the root causes of these concerns is necessary to determine the best mitigation strategies. Future NLB programs should focus their early efforts on increasing interest and buy-in among field providers through targeted messaging to ensure widespread acceptance and support of the program implementation.

Though there have been various challenges in the initial implementation of the program, the results from the first year of operation indicate that victims of a nonfatal overdose and their social networks are receptive to receiving naloxone kits at the scene of an overdose. Further, this interaction creates an alternative pathway to recovery resources through the partnership with the health department and the PRSS, as well as increasing access to naloxone for individuals who may have difficulties attending traditional community-based trainings. While additional evaluation of the outcomes associated with the HCNLB program are necessary, this public safety model has significant potential to reduce opioid-related fatalities.

Limitations

Several limitations must be considered when interpreting the results of this study. The short time frame of this study does not allow for long-term evaluation of the HCNLB program as associated with overdose related outcomes such as mortality rates and cost effectiveness. However, this presents the opportunity for further analysis of the impacts of these innovative harm reduction programs in future studies. Additionally, the data used for this study were only collected from a single county and as such, the results must be interpreted within the context of the opioid epidemic in that area. The relatively small sample size and concentration on a specific sub-population of individuals who experienced a nonfatal overdose also reduce the external validity

of the results. Thus, these findings are not generalizable to a larger population. The intention of this study is to provide descriptive information regarding this specific patient population to contribute to actionable knowledge for future development of this program in Howard County and research into naloxone leave behind initiatives in general.

Conclusion

As the severity of the opioid epidemic escalates, it is essential that we find innovative methods of reducing the morbidity and mortality associated with opioid overdose and the cascading negative consequences for the families and communities impacted by this crisis. This study highlights the importance of engaging an individual's family and social network when offering connection to treatment and recovery resources. EMS-based NLB programs constitute one novel approach to naloxone distribution that reaches those most at risk of a fatal opioid overdose. NLB initiatives have the potential to augment the existing community-based naloxone training structures, thus widening the scope and reach of the life-saving drug. Additionally, when partnered with a PRSS follow-up program, naloxone leave behind initiatives can increase access to treatment and recovery resources by providing a strong support structure for those suffering from addiction. While a great deal is known about the effectiveness of community-based naloxone training programs, further study into the efficacy of these EMS-based programs is needed to evaluate their cost-effectiveness, as well as their long-term impact on overdose-related mortality and other community outcomes.

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Table 1. Leave behind naloxone kit contents.

Leave Behind Kit Items	Quantity
Intranasal Naloxone Dose	2
Medication Disposal Bags	1
Gloves	1
CPR Barrier Shield	1
Educational Pamphlet	1

Table 2. Summary statistics (N=238)

Characteristic	Frequency (%)
NLB Kit Left	
Yes	120 (50.42%)
No	118 (49.58%)
Relationship of Kit Recipient to Patient (n=120)	
Patient/Self	44 (36.67%)
Family	57 (47.5%)
Friend	17 (14.17%)
Unknown	2 (1.66%)
Contact Number Obtained	
Yes	166 (69.75%)
No	72 (30.25%)
Contact Number Viable for Follow-Up (n=166)	
Yes	132 (79.52%)
No	34 (20.48%)
PRSS Connection	
Yes	143 (60.08%)
No	95 (39.92%)
Ambulance Transport Status	
Transported	194 (81.51%)
Not Transported/Refused	44 (18.49%)
Gender	
Male	178 (74.79%)
Female	60 (25.21%)
Race	
Non-Hispanic White	149 (62.61%)
African American	29 (12.18%)
Other	17 (7.14%)
Unknown	43 (18.07%)
Age Category	
18-24	17 (7.14%)
25-34	108 (45.38%)
35-44	47 (19.75%)
45-54	32 (13.45%)
55-64	26 (10.92%)
65 and over	8 (3.36%)

Table 3. Peer recovery support specialist connection descriptive statistics.

Characteristic	Connected to PRSS (%) n=143	Not Connected to PRSS (%) n=95	Chi Squared P-Value
Kit Status			
Accepted NLB Kit	87 (60.83%)	33 (34.74%)	**P<0.05**
Refused NLB Kit	56 (39.16%)	62 (65.26%)	
Relation to Kit Recipient			
Patient/Self	29 (20.28%)	14 (14.74%)	P>0.05
Family	45 (31.47%)	12 (12.63%)	**P<0.05**
Friend	12 (8.39%)	5 (5.26%)	P>0.05
Unknown	1 (0.70%)	1 (1.05%)	P>0.05
None Left	56 (39.16%)	62 (65.26%)	**P<0.05**
Ambulance Transport Status			
Transported	116 (81.12%)	78 (82.11%)	P>0.05
Not Transported/Refused	27 (18.88%)	17 (17.89%)	
Gender			
Male	107 (74.83%	71 (74.74%)	P>0.05
Female	36 (25.17%)	24 (25.26%)	
Race			
Non-Hispanic White	94 (65.73%)	55 (57.89%)	P>0.05
African American	17 (11.90%)	12 (12.63%)	P>0.05

Other	10 (6.99%)	7 (7.37%)	P>0.05
Unknown	22 (15.38%)	21 (22.11%)	P>0.05
Age Category			
18-24	12 (8.39%)	5 (5.26%)	P>0.05
25-34	64 (44.75%)	44 (46.32%)	P>0.05
35-44	31 (21.68%)	16 (16.84%)	P>0.05
45-54	14 (9.79%)	18 (18.95%)	**P<0.05**
55-64	16 (11.19%)	10 (10.53%)	P>0.05
65+	6 (4.20%)	2 (2.10%)	P>0.05

Table 4. Adjusted and unadjusted odds ratios associated with connection to peer recovery support specialist services.

Characteristic	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Relation to Kit Recipient		
Patient/Self	1.47 (0.73 – 2.96)	2.38 (1.10 – 5.14) *
Family	3.18 (1.57 – 6.40) **	5.16 (2.35 – 11.29) **
Friend	1.64 (0.56 – 4.84)	3.69 (1.13 – 12.06) *
Unknown	0.66 (0.04 – 10.71)	0.71 (0.04 – 12.91)
None Left	1.00 (Ref)	1.00 (Ref)
Ambulance Transport Status		
Transported	1.00 (Ref)	1.00 (Ref)
Not Transported/Refused	0.94 (0.48 – 1.83)	0.86 (0.41 – 1.81)
Gender		
Male	1.00 (Ref)	1.00 (Ref)
Female	1.01 (0.55 – 1.82)	1.13 (0.58 – 2.21)
Race		
Non-Hispanic White	1.00 (Ref)	1.00 (Ref)
African American	0.93 (0.42 – 2.05)	0.90 (0.35 – 2.33)
Other	0.95 (0.35 – 2.58)	0.95 (0.31 – 2.91)
Unknown	0.64 (0.33 – 1.24)	0.42 (0.19 – 0.91) *
Age Category		
18-24	1.00 (Ref)	1.00 (Ref)
25-34	0.94 (0.56 – 1.58)	0.58 (0.17 – 1.99)
35-44	1.36 (0.70 – 2.67)	0.85 (0.22 – 3.20)
45-54	0.46 (0.22 – 0.99) *	0.33 (0.08 – 1.31)
55-64	1.07 (0.46 – 2.47)	0.93 (0.22 – 3.97)
65+	2.03 (0.40 – 10.30)	1.18 (0.14 – 9.86)
Constant	-	1.58 (0.42 – 6.02)
Observations	238	238

Note: ** p<0.01, * p<0.05; DV = Peer Recovery Support Specialist Connection.