Demographic Analysis of Populations Accessing an Overdose Response Training Created at a College of Pharmacy

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ABSTRACT

OBJECTIVE: To analyze and compare demographics of two distinct populations accessing an online opioid overdose response training program hosted on two websites.

METHODS: A retrospective comparative analysis was completed using post-training survey data collected from October 2019 through October 2023. The training and survey were accessible through the University of Rhode Island and Rhode Island Department of Health websites. Demographics were compared between access points and to characteristics of populations at-risk for overdose.

RESULTS: 4,785 surveys were included. Participants accessing the training through the university website were more likely to be racial minorities and students. Participants accessing through the Department of Health were more likely to be gender minorities, low-income, and work in healthcare or trades. No differences in rurality or education level existed; both groups indicated satisfaction with training.

CONCLUSIONS: The same online overdose response training can reach different populations with demographic characteristics associated with increased overdose risk when made accessible through multiple access points.

KEYWORDS: naloxone; overdose; online training; opioid education; harm reduction; interdisciplinary collaboration

INTRODUCTION

The number of lives lost to drug overdose in the United States has increased over the last two decades, with over 107,000 lives lost to overdose annually from 2021 through 2023.[1-5] More than 75% of all overdose deaths are attributed to opioids, and the increase in synthetic opioids in the unregulated drug supply has caused a rapid and persistent rise in deaths from opioids since 2016.[3-6] The increased presence of synthetic opioids in non-opioid substances such as cocaine and methamphetamine has expanded the population of people who use drugs (PWUD) at risk for experiencing an opioid overdose beyond those who only use opioids.[6-8] Likewise, demographics of people with high risk for experiencing or responding to an overdose have shifted.[9-11] Within the last decade, all age groups 15 years of age and older, all race and Hispanic-origin groups and all genders (including transgender and gender non-conforming individuals) have experienced increases in fatal opioid overdoses.[2-6,12,13] The opioid crisis constitutes an ongoing public health emergency affecting diverse populations of people, underscoring the need for expansive, open-access harm reduction strategies.[16]

Numerous harm reduction efforts have been made on community, state, and federal levels to address the dynamic needs of PWUD and those responding to opioid overdoses. Many existing and effective harm reduction strategies are centered around improving access to naloxone, an opioid antagonist used to reverse overdoses, which can be administered by anyone.[17-19] Pharmacists and pharmacies have been integral in expanding naloxone distribution, with state legislation for co-prescribing naloxone with prescription opioids and statewide standing orders facilitating easier naloxone access through pharmacies.[20,21] Additionally, in 2023, the Food and Drug Administration (FDA) approved two naloxone nasal spray formulations over-the-counter (OTC), allowing for retail access at pharmacies without a prescription.[22,23] With increased naloxone distribution, it is necessary to ensure its appropriate and effective use through overdose response training.

Overdose education and naloxone distribution (OEND) programs combine naloxone distribution and training on overdose recognition, response, and naloxone administration. There are myriad benefits reported by people who participate in OEND programming, including changed attitudes and increased confidence with overdose recognition and naloxone administration.[24] While OEND programs are one of the most effective harm reduction strategies, barriers to engagement exist, and many PWUD report little to no OEND engagement, despite knowing about available services. Stigma, physical inaccessibility, and mistrust of people providing OEND education represent key barriers to OEND engagement.[25-29] A compelling strategy for mitigating access and stigma barriers is remote provision of overdose response education and mail-order distribution of naloxone.

The increased national death toll from opioid overdose has been reflected at the state level in Rhode Island.[30] In efforts to address barriers surrounding OEND engagement and utilize the effectiveness of OEND programming, an interdisciplinary team created the Community First Responder Program (CFRP) at the state university college of pharmacy in 2019.

The interprofessional team which created the CFRP was comprised of pharmacists, a pharmacy technician, pharmacy and nursing students and faculty, a licensed mental health counselor, and representatives from the College of Environmental and Life Sciences. The CFRP is a fully remote, open access online overdose response training program and wholesale pharmacy which distributes naloxone and other harm reduction supplies. The CFRP has been hosted and accessible on the university website (UNIV) since its inception.[31] In 2021, the Rhode Island Department of Health (RIDOH) fully funded the CFRP initiative and expanded access by hosting the training program and its survey on their harm reduction website, Prevent Overdose Rhode Island (DOH; https://preventoverdoseri.org/get-naloxone).[32] Since the program's creation at UNIV, and subsequent expansion by DOH, over 4,700 individuals have completed the training program and responded to its survey. In this paper, the demographics of people accessing the training through UNIV are compared to those of individuals accessing through DOH, and both are compared to pre-defined risk factors for experiencing or responding to an overdose.

METHODS

Study Aim

The aim of this study is to compare the demographics of two distinct populations (UNIV and DOH) completing an online overdose response training module based on predefined risk factors for experiencing or responding to an overdose. The goal is to expand current knowledge on overdose response education uptake and to inform development of strategies to broaden access to OEND programs.

Design and Setting

This is a retrospective comparative analysis of demographic data from individuals who completed an online overdose response training program and its post-survey. All data were voluntarily provided and de-identified prior to inclusion in analysis. The study was approved by the state university Institutional Review Board (IRB reference #2124391-2).

The CFRP and PORI are two internet-based harm reduction programs serving communities in Rhode Island. Both programs house the same online overdose response training program and post-survey. The public may freely access the training by visiting either the state university website (UNIV) or the state Department of Health's harm reduction website (DOH).[31,32]

Data Sources and Study Population

Post-training surveys from October 2019 to October 2023 submitted through UNIV and DOH access points were included in the study. Responses collected from both the UNIV and DOH platforms contain demographic information as well as respondents' satisfaction with and perceived benefits of the overdose response training module.

The post-training survey on both UNIV and DOH websites collected demographic information including gender identity, race/ethnicity, highest educational level achieved, primary employment type, and zip code of employment. Additionally, responses regarding the perceived benefits of and satisfaction with the training program were collected.

Responses were recorded as selections from a list of predetermined options, self-identification free text responses, or declining to respond. For gender identity, participants could select male, female, transgender, gender non-conforming, other (with free text response), or decline to respond. Race and ethnicity options included White, Black/African American, American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, Hispanic/Latino, or other. Educational level options included less than high school, high school diploma/GED, some college/no degree, associate's, bachelor's, master's or doctoral degree/equivalent, or other. Data on primary profession and principal employment setting were collected through free text responses.

Data Organization

To compare population demographics from the UNIV and DOH websites to demographics of populations with increased risk in Rhode Island, "risk" first needed to be defined. Current literature assessing demographics of individuals at increased risk in the United States indicates that those of lower socioeconomic status, in rural areas, racial and gender minorities, those with a high school degree or lower level of education (used as a proxy for health literacy), and certain age groups are at greater risk of experiencing a fatal opioid overdose than others.[1-7,9-15]

To prepare the post-training survey data set for analysis, responses were further classified as follows: zip codes were matched for rurality using the definition of rurality set by RIDOH; zip codes were matched for area income status using median household income data from the Rhode Island Department of Labor and Training, with towns classified as either "low-income" (bottom 20th percentile of cities/towns in the state), or "other" (above the 20th percentile); primary profession setting was categorized using the United States Bureau of Labor Statistics Standard Occupation Codes, then further refined using the United States Office of Personnel Management Classification of General Schedule Positions.[33-36]

For gender identity, gender minorities (transgender, gender non-conforming, and other as identified by free text) were compared to cis-gendered individuals (man or woman). For racial identity, White individuals were compared to racial minorities, defined as all other races/ethnicities besides White, including mixed-race (any combination of two or more racial identities). Education level, used as a proxy for health literacy, was compared as less than high school versus all other levels/degrees achieved above high school. In

terms of employment type, healthcare professionals were compared to other professionals, trade/craft/labor workers, students, or "other" defined as retired, unemployed, receiving disability, or stay-at-home parent. Because UNIV is hosted and promoted on the state university website, an additional analysis was conducted to compare students to healthcare professionals, other professionals, trade/craft/labor workers, or "other" employment types.

STATISTICAL ANALYSIS

A total of 4,785 surveys (UNIV n=4097; DOH n=688) with partially and/or fully completed responses were included in the analysis. Descriptive statistics were initially applied to determine the percentages of each response type, including unknown or missing responses, for each data set from their respective access points. Blank responses were excluded from analysis on a question-by-question basis, and the number and percentage of non-responses per question are reported in the results tables.

To identify statistically significant differences between the two data sets by access point (UNIV versus DOH), Chi-square tests were performed to assess differences in population demographics based on access point. If Chis-square assumptions were not met, Fisher's exact tests were applied. A simple univariate logistic regression model was used to estimate the association between access points and demographic variables, reporting odds ratio (OR) and 95% confidence intervals. Statistical analyses were conducted using SAS version 9.4.

RESULTS

Descriptive statistics of the two populations analyzed are presented in **Table 1**. Statistically significant differences were observed between populations accessing the training and survey through UNV compared to DOH in terms of gender (χ^2 = 20.4, p< 0.0001), race (χ^2 = 52.0, p< 0.0001), income (low-income vs. other; χ^2 = 21.2, p< 0.0001), and profession (χ^2 = 457.4, p<0.0001)) as presented in **Table 2**.

When comparing demographics of individuals accessing the survey through UNIV compared to DOH, individuals accessing through UNIV were less likely to be gender minorities (OR 0.319; 95% CI: 0.189–0.538) but were twice likely to be racial minorities (OR 2.099;95% CI: 1.710–2.576) compared to DOH respondents. Additionally, UNIV participants were less likely to work in low-income areas (OR 0.589;95% CI: 0.469–0.739) and less likely to be non-healthcare professionals (OR 0.424; 95% CI 0.345–0.521) compared to DOH participants. UNIV participants were nearly nine times more likely to be students than healthcare professionals (OR 9.909; 95% CI: 6.615–14.841) and were less likely to be a trade/craft/or labor worker than healthcare professional (OR 0.362; 95% CI 0.255–0.513), or to be retired, unemployed,

Table 1. Demographic characteristics of survey respondents overall and by data source.

	Overall N=4785, (%)	UNIV N=4097, (%)	DOH N=688, (%)
Gender			
Gender Minority	64 (1.3)	42 (1.0)	22 (3.2)
Other	4628 (96.7)	3965 (96.8)	663 (96.4)
Unknown/missing	93 (1.9)	90 (2.2)	<5 (0.4)
Race			
Racial minority	1403 (29.3)	1278 (31.2)	125 (18.2)
Other (White)	3288 (68.7)	2728 (66.6)	560 (81.4)
Unknown/missing	94 (2.0)	91 (2.2)	<5 (0.4)
Education			
Less than high school	68 (1.4)	55 (1.3)	13 (1.9)
High school and above	4531 (94.7)	3882 (94.8)	649 (94.3)
Unknown/missing	186 (3.9)	160 (3.9)	26 (3.8)
Income level			
Low-income	558 (11.7)	360 (8.8)	198 (28.8)
Other income	977 (20.4)	738 (18.0)	239 (34.7)
Unknown/missing	3250 (67.9)	2999 (73.2)	251 (36.5)
Location			
Rural	274 (5.7)	203 (5.0)	71 (10.3)
Non-rural	1793 (37.5)	1271 (31.0)	522(75.9)
Unknown/missing	2718 (56.8)	2623 (64.0)	95 (13.8)
Primary Profession			
Healthcare professional	1654 (34.6)	1410 (34.4)	244 (35.5)
Professionals	773 (16.2)	549 (13.4)	224 (32.6)
Trade, craft,	170 (3.6)	115 (2.8)	55 (8.0)
Student	1573 (32.9)	1546 (37.7)	27 (3.9)
Other	123 (2.6)	73 (1.8)	50 (7.3)
Unknown/missing	492 (10.3)	404 (9.9)	88 (12.8)

Note: The sum of some percentages are greater than 100%, figures were rounded up. The participants for variables with fewer than 5 responses were not reported.

Table 2. Differences in Proportions of Gender, Race, Income, Residence and Profession Demographics within UNIV relative to DOH

Demographics	UNIV vs. DOH [Chi-square, χ^2, (p-value)]
Gender (minority vs other)	20.4 (<0.0001*)
Race	52.0 (<0.0001*)
Income	21.2 (<0.0001*)
Residence	1.2 (0.2753)
Education	1.2 (0.2636)
Primary Profession	457.4 (<0.0001*)

*Significance level p≤0.05

receiving disability, or a stay-at-home parent (OR 0.253; 95% CI 0.172–0.371).

When comparing the student population to other professionals, UNIV respondents were significantly less likely to be healthcare professionals, other professionals, trade/craft/labor workers, or "other". The results for differences in rurality and education level (and therefore, health literacy) based on access point were not statistically significant. Complete results are presented in **Tables 3** and **4**.

Participants across both access points were satisfied with the training program and found it to be useful. Of all participants, the majority reported that they were satisfied with the training (97.30%), found the training to be beneficial (96.26%), and found the training to be applicable (95.68%). Statistically significant differences were found in training perceptions from UNIV respondents compared to DOH respondents in terms of training satisfaction (χ^2 = 7.9, p=0.0190), training benefit (χ^2 = 19.3, p< 0.0001), and training applicability (χ^2 = 10.4, p = 0.0055). Results for perceived utility and satisfaction with the training content are presented in **Tables 5** and **6**.

Table 3. Relationships between access points and population demographics

Demographics	UNIV vs. DOH (Odds ratio, [95% confidence interval (CI)])
Gender (Minority vs Other)	**0.319 [0.189, 0.538]**
Race (Minority vs Other (White)	**2.099 [1.710, 2.576]**
Income (Low vs Other)	**0.589 [0.469, 0.739]**
Residence (Rural vs non-rural)	1.174 [0.880, 1.567]
Education (High school and above vs Less than high school)	1.415 [0.769, 2.604]
Primary Profession	
Professional vs. Healthcare Professional	**0.424 [0.345, 0.521]**
Student vs. Healthcare Professional	**9.909 [6.615, 14.841]**
Trade Worker vs. Healthcare Professional	**0.362 [0.255, 0.513]**
Other vs. Healthcare Professional	**0.253 [0.172, 0.371]**

Statistically significant results are **bolded**.

Table 4. Additional analysis of primary professions compared to students

Primary Profession	UNIV vs. DOH (Odds ratio, [95% CI])
Healthcare Worker vs. Student	**0.101 [0.067, 0.151]**
Professional vs. Student	**0.043 [0.028, 0.065]**
Trade Worker vs. Student	**0.037 [0.022, 0.060]**
Primary profession (Other vs Student)	**0.025 [0.015, 0.043]**

Statistically significant results are **bolded**.

Table 5. Satisfaction with training quality, perceived utility benefit and perceived applicability reported by respondents.

Response	Overall n=4785 (%)	UNIV n=4097 (%)	DOH n=688 (%)
Training quality			
Satisfied	4502 (97.30)	3844 (97.12)	658 (98.36)
Neutral	104 (2.25)	98 (2.48)	6 (0.90)
Dissatisfied	21 (0.45)	16 (0.40)	5 (0.75)
No response	158	139	19
Training benefit			
Agree	4453 (96.26)	3827 (96.77)	626 (93.30)
Neutral	152 (3.29)	112 (2.83)	40 (5.96)
Disagree	21 (0.45)	16 (0.40)	5 (0.75)
No response	159	142	17
Training application			
Agree	4424 (95.68)	3798 (96.03)	626 (93.30)
Neutral	182 (3.93)	142 (3.59)	40 (5.96)
Disagree	20 (0.43)	15 (0.38)	5 (0.75)
No response	159	142	17
Willingness to refer others to training program			
Yes	4573 (99.18)	3912 (99.24)	661 (98.80)
No	38 (0.82)	30 (0.76)	8 (1.20)
No Response	174	155	19

Table 6. Differences in survey responses for quality, benefit, application, and likelihood to refer others to training program within UNIV relative to DOH

Demographics	UNIV vs. DOH [Chi-square, χ^2, (p-value)]
Training quality	7.9 (0.0190)
Training benefit	19.3 (<0.0001)
Training application	10.4 (0.0055)
Would refer others to training	1.3 (0.2501)

*Significance level p≤0.05

DISCUSSION

To the authors' knowledge, this is the first study analyzing and comparing demographics of populations accessing an overdose response training created at a college of pharmacy. We found significant differences in the demographics of both populations accessing the training through its two access points, and individuals across both access points perceived the training to be useful and satisfactory. Differences in demographics between the two unique populations may be attributed to different advertising strategies used to attract participants to each website. The CFRP website is advertised on the URI website and campus, and the DOH PORI website is advertised through both online and published materials. Although some demographics associated

with at-risk populations were not significantly represented in the findings (rural versus non-rural settings and education level), the results of this study can be used to guide development and implementation of future trainings, as well as expansion of existing programs to reach the growing number of at-risk populations.

Though OEND programs represent a necessary and effective harm reduction strategy, several studies have assessed how OEND operations can be improved.[25-28] A qualitative study by Enich, et al 2023 sought to gain understanding of the perspectives of PWUD and harm reductionists on what an ideal OEND program would look like. Many of the PWUD interviewed reported little to no OEND engagement, despite knowing about available OEND services. Lack of engagement can be attributed to barriers like stigma, accessibility, and mistrust of people providing overdose response education. There are myriad ways to address barriers surrounding engagement. The CFRP mitigates access barriers by design, anyone with internet can access it. Additionally, since it can be completed remotely, it is a discreet option for people who may not access physical OEND programs because of stigma. Lastly, the overdose response training module was written and designed by a team of healthcare professionals including pharmacists, pharmacy technicians, nurses, and a licensed mental health counselor.

Interdisciplinary collaboration is a key component of developing robust and sustainable OEND programs.[26,27] The program was started by an interdisciplinary team, with contributors and users coming from diverse professional and educational backgrounds. Wenger, et al 2022 completed a study to identify best practice recommendations for community-based OEND programs.[29] Researchers assembled a team of OEND experts from diverse backgrounds (including syringe service program workers, health departments, and OEND researchers), generated a list of best practices, and ranked them. Among increased availability and distribution of naloxone itself, needs-based naloxone training, training of laypeople to provide naloxone education, and provision of overdose response information and educational materials were highlighted as best practices. The CFRP achieves all of these, with the added benefit of being hosted online and open for access at any time. Additionally, Wenger, et al. identified naloxone outreach and marketing efforts to be an important best practice.[29] This represents the need to increase awareness of the availability of the training, and other online-only OEND programs, in order to reach the at-risk populations identified in the study.

The training program is important because it can be accessed by anyone, spanning from professionals to students, community laypeople, and PWUD. Additionally, it is not a scheduled webinar and can be completed at any time without the need for an active facilitator. Previous studies evaluating opioid overdose response trainings have focused on the impact of providing training to healthcare professionals, first responders, and people who use drugs in the forms of webinars and short courses. The CFRP is unique in that it is not specific to any one audience and does not need to be completed at a specific time, with the goal of providing comprehensive overdose response education to anyone who sees its value.

Limitations

This study focused on characterizing and comparing demographics of two populations accessing an online overdose response training program based on pre-defined at-risk demographics. Importantly, the location data collected (zip codes) and subsequent data organization (rurality and income coding) do not necessarily reflect the areas in which respondents live, as zip codes provided were for addresses of employment. For the Rhode Island overdose death data, it is important to note that Rhode Island residents who died of an overdose outside of the state were not captured or included.

The training program does not include a pre-module survey at this time, so change in attitudes before and after completing the training were not assessed. Additionally, while the training program is offered in both English and Spanish, the survey was only published in English, potentially missing data from Spanish-speaking participants. However, over the four-year data collection period, only nine requests for harm reduction supplies were submitted through the mail order that is linked to the program. Therefore, we suspect uptake from Spanish-speaking individuals to be low. Furthermore, it is important to recognize that the post-training survey is entirely voluntary and thus it is unknown how many individuals completed the training but did not complete the survey. Lastly, although the training is open access, it is internet-based, therefore it is not available to individuals without internet access.

CONCLUSION

With the expansion of populations at-risk for experiencing or responding to an opioid overdose, it is necessary to make high-quality overdose response training freely available. The same overdose response training was hosted at two distinct access points and advertised to different populations using different strategies. The populations accessing the training through its two access points were distinctly different. Results establish that hosting a training created by an interprofessional team on different websites can attract different populations with demographic characteristics associated with increased overdose risk and expand the reach of OEND programming.

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