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Pilot Testing an Asynchronous Online Harm Reduction and Pharmacotherapy Stigma Reduction Training for Substance Use Treatment Professionals

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Abstract

Harm reduction and pharmacotherapy approaches to addressing substance use disorder are evidence-based practices for reducing adverse health outcomes. However, professional stigma toward these approaches impedes implementation. In this pilot study, professionals working in substance use treatment services received a 4-hour asynchronous online harm reduction and pharmacotherapy training. Pre- and post-training surveys used Likert-scale questions to assess attitudes and planned actions. Four of the 23 survey items demonstrated a significant change in pre- to post-attitudes and planned actions relating to harm reduction or pharmacotherapy. These items included less attitudinal stigma towards: methadone and buprenorphine ($p = .021$), overdose prevention sites/“drug consumption facilities” ($p = .025$), and naloxone distribution ($p = .017$), as well as lower intent to primarily promote abstinence-based interventions ($p = .007$). This study demonstrated that online asynchronous educational interventions show promise for reducing

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stigmatizing attitudes towards evidence-based practices among substance use treatment professionals.

Keywords

stigma, medications for opioid use disorder, methadone, buprenorphine, treatment professionals, harm reduction, overdose prevention sites, naloxone, education, online learning

Introduction

Drug overdose deaths have increased 1040% from 2013 to 2019 in the United States (U.S.) (Mattson et al., 2021). In 2021 alone, more than 103,000 people died from drug overdose (Ahmad et al., 2023). The need for better uptake of interventions to decrease drug-related morbidity and mortality is evident. Two categories of evidence-based approaches are harm reduction and treatment with pharmacotherapy. Harm reduction is an approach that aims to reduce adverse outcomes associated with substance use, and may utilize naloxone distribution (an opioid overdose reversal medication), provide sterile injection supplies, and operate overdose prevention sites (OPS) where people can consume drugs more safely with support from trained staff (sometimes called “safe consumption sites”). Pharmacotherapy includes medications for substance use disorders, with buprenorphine, methadone, and naltrexone approved as medications for opioid use disorder (MOUD) treatment in the U.S.

Harm reduction services have strong evidence for reducing adverse outcomes, including reductions in overdose mortality, and improved treatment retention (Levensgood et al., 2021; Ritter & Cameron, 2006). The scientific evidence supporting MOUD is substantial. Methadone and buprenorphine are effective for improving treatment retention (Lim et al., 2022) and reducing overdose risk (Wakeman et al., 2020). Naltrexone has not been shown to reduce overdose risk (Wakeman et al., 2020), but still may improve treatment retention when compared to non-pharmacological approaches (Lim et al., 2022).

Despite scientific support, these approaches are often stigmatized. Stigma is the process by which an attribute is deemed worthy of prejudicial attitudes or discriminatory treatment (Goffman, 1963). Previous research primarily focused on reducing stigmatizing attitudes among health professionals and trainees toward people who use drugs, particularly among non-specialized health professionals (Bielenberg et al., 2021; Livingston et al., 2012), medical residents (Avery et al., 2019), and other health professional students (Crapanzano et al., 2014). Yet stigma toward the usage or provision of harm reduction approaches and MOUD continues to impede adoption in the U.S. (Dickson-Gomez et al., 2022; Paquette et al., 2018; Victor et al., 2022; Wakeman & Rich, 2018), even among those who work in substance use treatment services (Aletraris et al., 2016; Madden, 2019; Pasman et al., 2022). For example, negative attitudes toward overdose prevention sites are pervasive, with only 29% of U.S. respondents in one sample supporting their legalization (McGinty et al., 2018). Among treatment providers, some healthcare professionals have expressed aversion to long-term treatment with MOUD (Dickson-Gomez et al., 2022), despite clinical guidelines advocating for an open-ended and patient-centered approach to treatment (American Society of Addiction Medicine, 2015, 2020).

For treatment professionals, some of the documented contributors associated with the presence of stigma included lack of training in pharmacotherapy or harm reduction modalities, and a preference for abstinence treatment approaches (Madden et al., 2021). Common stigmatizing misconceptions include beliefs that encouraging cessation of MOUD is best practice, and “risk compensation” beliefs that interventions like overdose prevention sites and naloxone

distribution encourage harmful drug use (Behar et al., 2018; Madden et al., 2021). And among non-specialized healthcare providers practicing outside of dedicated addiction treatment settings, generalized stigma toward people who use drugs also contributes to stigma toward MOUD (Madden et al., 2021).

This “intervention stigma,” or negative attitudes and discriminatory actions toward use or provision of a medical treatment or service (Madden, 2019), is consequential because such stigma not only contributes to low uptake of effective public health tools but also can compound other forms of stigma directed toward people who use drugs. Despite growing recognition of the ways stigma erects barriers to appropriate care, there is limited empirical evidence about how to reduce stigma toward harm reduction and MOUD among health professionals.

Trainings with healthcare providers have been shown to increase knowledge and reduce stigmatizing attitudes towards patients with substance use disorders generally (Livingston et al., 2012), though few studies specifically address stigma toward harm reduction and MOUD. Contact-based educational interventions connecting professionals to individuals with lived experience of substance use have shown the most consistent stigma reduction trends, with significant results among live/synchronous, in-person, and asynchronous online training formats (Bielenberg et al., 2021). Preliminary research has also suggested that a 4-hour synchronous training addressing stigmatizing professional attitudes toward harm reduction and pharmacotherapy can improve attitudes towards these interventions (Sulzer et al., 2022). However, no studies have assessed whether a flexible virtual asynchronous training format may affect professional attitudes towards these evidence-based approaches for substance use.

Online learning is often just as effective as in-person training for improving knowledge among health professionals (McKinney, 2017; Reeves et al., 2017). It also has the added benefit of reducing many logistical and geographic barriers to access. However, for stigma toward harm reduction and MOUD among treatment professionals, the efficacy of asynchronous, online education has not been evaluated. This pilot study evaluated changes in both attitudes and planned actions associated with an asynchronous online harm reduction and MOUD training for substance use professionals. This research may provide foundational knowledge for future programs seeking to implement harm reduction or pharmacotherapy services in treatment contexts where professional time is limited, and stigma toward evidence-based substance use approaches is high.

Methods

Data Collection Procedures

People who work in any substance use treatment modality in Utah were targeted for pilot study recruitment using convenience sampling between June 2019 through January 2021. There was no compensation for this training, but Continuing Education Units, which are required for ongoing licensure for substance use disorder counselors, pharmacists, physicians, psychologists, social workers, and physician assistants were provided. The pilot training developed by our team was not mandatory for licensure. Recruitment for the pilot study occurred via email using two mechanisms: direct emails to individuals holding Utah licenses as a “substance use disorder treatment counselor” registered with Utah’s Division of Professional Licensing ($n = 444$), and emails to the directors of the thirteen Utah Regional Health Department offices, soliciting participation from any of their employees and partners who may be involved in substance use treatment work, including clinical social workers, pharmacists, and physicians. The use of this method covered all of the licensed counseling professionals in Utah who were working in private practice and treatment centers, as well as a variety of other treatment professionals working in or with regional Utah substance use prevention services. The training was advertised as an “Introduction to Harm Reduction Training for Substance Use Disorder Professionals” and did not target volunteers with

specific past professional experiences, or those working in particular treatment modalities. The research did not collect identifiable information and was categorized as program evaluation for a federally funded grant, and thus the Utah State University IRB reviewed the study and determined the training evaluation to be non-human subjects research.

Upon enrollment in the free course, participants were asked to take a pre-training survey. They received a post-training survey upon course completion. Both used 3-point Likert-scale questions to assess respondent knowledge, attitudes, and planned actions related to harm reduction and MOUD pharmacotherapy (see [supplement](#) for questionnaire). As there were no validated measures of stigma toward harm reduction and MOUD for health professionals at the time of data collection, we developed survey questions assessing these features of stigma for the pilot study based on a systematic review of stigma toward MOUD and harm reduction conducted by our study team that identified common forms of stigma toward these approaches to substance use ([Madden et al., 2021](#)).

Intervention Design

The 4-hour harm reduction and MOUD training was delivered asynchronously through online videos and readings. As research on substance use stigma reduction efforts is relatively nascent, some features of the training, including overall length and decisions to present content in videos versus readings, are not based on a consensus for best practices, as these vary greatly between studies and are still unknown ([Bielenberg et al., 2021](#)). However, the content of the training was selected based on a systematic review of the drivers of stigma toward MOUD and harm reduction completed by this study team ([Madden et al., 2021](#)). The review identified both lack of training and knowledge as potential drivers of stigma toward MOUD and harm reduction (e.g., [Knudsen et al., 2005](#); [Livingston et al., 2018](#)). Therefore, the asynchronous training we developed described examples of harm reduction and MOUD programs in the U.S. and abroad, and scientific evaluations of program efficacy. We also included direct correction of common misconceptions identified in the review, such as the belief that methadone and buprenorphine treatment should be stopped after a few weeks or months, or that these medications do not offer improved outcomes over ongoing illicit drug use ([Madden et al., 2021](#)). Videos included an overview of Portugal's approach to drugs that focused on structural efforts to decriminalize substance use and adopt public health interventions that embrace harm reduction and MOUD ([Colledge-Frisby et al., 2023](#)), and the operations of a U.S. harm reduction service center that seeks to reduce the negative effects of substance use for people who use drugs despite societal criminalization. These were used to illustrate how harm reduction and MOUD approaches may be mobilized in practice in both hostile and less stigmatizing cultural contexts.

To address stigma toward people who use drugs more generally, the training drew on a systematic review by [Livingston et al. \(2012\)](#) that highlighted the importance of contact-based education with people with lived substance use disorder experience, and critical reflection techniques that encouraged learners to incorporate knowledge into practice. The training included a video with storytelling by an identifiable person with lived experience of substance use, who currently works in Utah harm reduction and counseling services supporting patients who currently use drugs and/or are treated with MOUD. Her story not only focused on humanizing people who use drugs but also focused on humanizing people who use pharmacotherapy and harm reduction services. To encourage critical reflection, a video case study depicted an emergency department interaction between a clinician using a harm reduction approach with a patient recovering from an overdose, and the learner was then asked to reflect on how they could use such an approach in their own work.

Analysis

Descriptive and inferential statistics were used to assess the impact of the training. Descriptive statistics were used to assess the participant characteristics of the sample using frequencies and counts. We assessed the frequencies and counts of the Likert-type measures of stigmatizing attitudes and planned actions. Given the sample size and the skewed distributions of the measures, we used Fisher's exact tests to assess whether the response patterns changed from pre-training to post-training for stigmatizing attitudes and planned actions. To highlight the nature of the significant changes, we used alluvial plots to show the flow of change from pre-training to post-training. All data cleaning and statistical analyses were performed in R version 4.1.0. using ggalluvial, tidyverse, and gtsummary (Brunson & Read, 2023; R Core Team, 2020; Sjoberg et al., 2021; Wickham et al., 2019).

Results

Participant Characteristics

A total of 76 individuals participated in the training, of which 32 participants responded to both pre-training and post-training surveys ($n = 63$ responded pre-training and $n = 36$ responded post-training). Most participants (61%) were from the target population of individuals working in substance use disorder treatment, and this group made up 66% of those with matched pre- and post-training surveys (Table 1). Fifty percent of participants were located in Utah, and the other half of respondents came from 14 other states (see supplement for maps of respondent locations). Most participants identified as female (54%), non-Hispanic White (67%), and had a master's degree or other post-graduate education (53%). The median number of years of experience was 5 (interquartile range = [4, 13]).

Changes in Stigmatizing Attitudes and Planned Actions

Significant changes were observed in four of the 23 survey items that captured attitudes and planned actions related to harm reduction or MOUD approaches. These items included more accepting attitudes towards methadone and buprenorphine ($p = .021$, Cramer's $V = .275$), OPS/"drug consumption facilities" ($p = .025$, Cramer's $V = .286$), naloxone distribution ($p = .017$, Cramer's $V = .278$), and lower intent to primarily promote abstinence-based interventions ($p = .007$, Cramer's $V = .363$). Figure 1 illustrates items with significant changes from pre-to post-training survey responses. One attitude toward OPS, a decrease in the belief that such interventions increase addiction rates, also approached significance ($p = .056$, Cramer's $V = .241$). Our findings thus suggest short term reductions in two stigmatizing attitudes regarding the effect of OPS on fatal overdose and substance use disorder rates. However, another attitude did not change: a willingness to work at an OPS. A reduction in risk compensation beliefs was also evident, as participants had a reduced agreement with the belief that naloxone increases drug use. The results similarly suggest that participants were more likely to disagree with promoting MOUD cessation after taking the online course.

The alluvial plots in Figure 1 illustrate that across the significant survey questions, the most common shift was among participants who initially responded "neutral" on stigmatizing attitude statements at pre-training, and then shifted to a response corresponding to increased acceptance of harm reduction and pharmacotherapy at post-training (i.e., "disagree" or "agree" depending on whether the item was reverse coded or not). For example, significant changes in the intention to only promote abstinence-based interventions at work were documented as many individuals who responded "neutral" at pre-training were more likely to "disagree" with this intention post-training.

Table 1. Participant Demographic Characteristics.

| | All training participants (n = 76) | (%) | Training participants with matched pre- and post-surveys (n = 32) | (%) |
|---|------------------------------------|-------|---|-------|
| Gender | | | | |
| Man | 22 | (29) | 7 | (22) |
| Woman | 41 | (54) | 23 | (72) |
| Other, or prefer not to disclose | 2 | (3) | 2 | (6) |
| Unknown | 11 | (14) | | |
| Race/Ethnicity | | | | |
| Asian American | 1 | (1) | 1 | (3) |
| Hispanic | 7 | (9) | 3 | (9) |
| Native American | 2 | (3) | 1 | (3) |
| Native American, hispanic | 1 | (1) | 1 | (3) |
| Non-hispanic white | 51 | (67) | 24 | (75) |
| Non-hispanic white, other race/ethnicity | 1 | (1) | 0 | (0) |
| Other race/ethnicity | 1 | (1) | 1 | (3) |
| Unknown | 12 | (16) | 1 | (3) |
| Education | | | | |
| Associate degree | 3 | (4) | 1 | (3) |
| Bachelor's degree | 18 | (24) | 9 | (28) |
| Master's degree | 36 | (47) | 18 | (56) |
| Other advanced degrees (MD, PhD, etc.) | 4 | (5) | 1 | (3) |
| Some college | 4 | (5) | 3 | (9) |
| Unknown | 11 | (14) | | (0) |
| Works in substance use disorder treatment services | | | | |
| Yes | 46 | (61) | 21 | (66) |
| No | 19 | (25) | 0 | (0) |
| Unknown | 11 | (14) | 11 | (34) |
| Years of work experience (median, IQR) | 5 | 4, 13 | 5 | 4, 13 |
| Current or previous work in a harm reduction or MOUD program (e.g., methadone clinic, needle/syringe distribution program) | | | | |
| Yes | 21 | (28) | 10 | (31) |
| No | 42 | (55) | 21 | (66) |
| Unknown | 13 | (17) | 1 | (3) |

Discussion

This pilot study showed that an asynchronous online training for substance use professionals that targets known drivers of intervention stigma (e.g., knowledge gaps, common misperceptions) can effectively reduce stigma. Specific changes included less attitudinal stigma toward methadone and buprenorphine, OPS/"drug consumption facilities," and naloxone distribution. Participants also reported a decreased intent to primarily promote abstinence from substances in their work. While there is no standardized measure for intent to act, this finding regarding work-related intentions suggests that this training may have effects beyond attitudinal changes and may influence professional behaviors as well. We also found evidence that virtual contact with people with lived

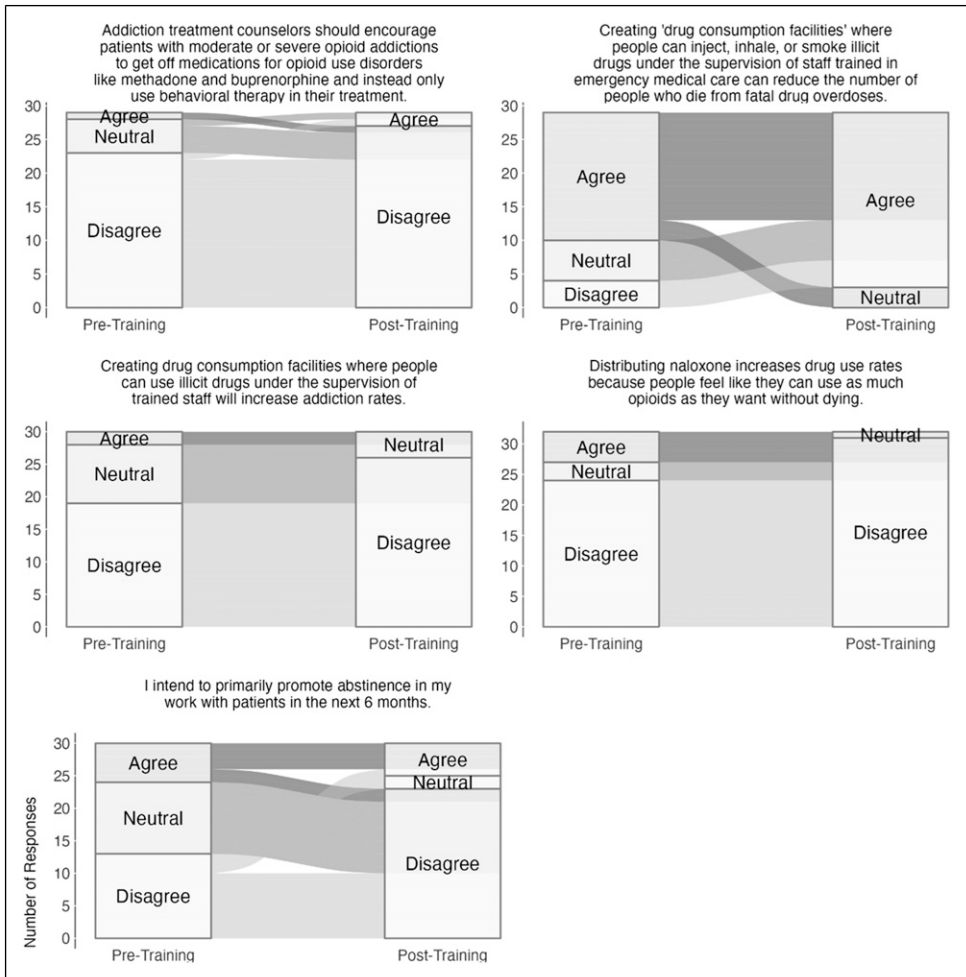


Figure I. Alluvial plots showing changes from pre-training to post-training for items with significant changes. The Y-axis represents the number of responses to each item (see [supplement](#) for table of response counts for all significant items).

experiences of substance use, harm reduction and MOUD may help reduce stigmatizing attitudes and improve planned actions regarding care. These results are promising because they offer evidence that this pervasive and well-documented stigma can be interrupted through online educational interventions.

Much of the literature on substance use stigma reduction focuses on drug use itself, rather than the possibility of stigma toward particular treatment modalities and approaches (Bielenberg et al., 2021; Livingston et al., 2012; Madden et al., 2021). Recent research suggests that asynchronous education may improve public attitudes towards evidence-based drug use policies, including some forms of harm reduction (Strickland et al., 2022), as well as the intention of law enforcement officers to inform people of syringe possession legality (Arredondo et al., 2019). However, the focus of study in stigma reduction education is often on beliefs among nonspecialized healthcare professionals (Bielenberg et al., 2021; Livingston et al., 2012), the general public (e.g., Luty et al., 2007; Strickland et al., 2022), or criminal-legal professionals (e.g., Arredondo et al., 2019;

Friedmann et al., 2015), while specialized providers of substance use treatment have long been neglected for their potential to harbor stigmatizing attitudes toward specific evidence-based interventions.

The danger that persons entering substance use treatment or exploring harm reduction approaches might be deterred because a provider or other professional they interact with subscribes to scientifically inaccurate beliefs about harm reduction or MOUD has substantial implications. Particularly because interventions under these umbrellas reduce mortality rates and increase treatment adherence, there is a strong public health argument for ensuring these interventions are well-supported by treatment professionals. Overdose mortality rates have continued to rise, suggesting treatment and harm reduction practices are not being sufficiently leveraged. In fact, only 27.8% of people with OUD received medication treatment in 2019 (Mauro et al., 2022), while the fatal opioid overdose rate in rose from 14.3 in 2018 to 15.2 deaths in 2019 per 100,000 people (Centers for Disease Control and Prevention (CDC), 2023). Widespread stigma toward effective interventions (Adams & Volkow, 2020; Wakeman & Rich, 2018) is at least a partial cause. Furthermore, an audit study found that only 29% of U.S. residential treatment programs offer MOUD, and many actively discouraged methadone and buprenorphine treatment (Beetham et al., 2020). Meanwhile, systematic reviews of existing studies clearly show people with OUD benefit from methadone and buprenorphine (Mattick et al., 2014) and harm reduction services, such as syringe programs (Fernandes et al., 2017) and naloxone distribution (Clark et al., 2014). Improving knowledge, attitudes, and actions towards these interventions among professionals working in healthcare and social services, especially in specialized substance use treatment services, may improve availability of such services and the dignity of the contexts in which patients make decisions about their substance use and treatment.

Of particular importance were our findings around “risk compensation,” or when safety policies designed to prevent injury may unintentionally encourage unsafe behavior. This is a pervasive concern that has historically limited naloxone distribution among healthcare and first responder professionals, due to the false belief that overdose reversal medications may encourage drug use (Behar et al., 2018; Winograd et al., 2020). This training highlighted the absence of research demonstrating risk compensation effects from naloxone distribution, and assuaged fears by emphasizing reduced mortality rates associated with these approaches. This strategy can be employed more broadly in future trainings, potentially increasing the likelihood that providers and other professionals will be willing to provide overdose reversal medications in low-barrier manners.

Limitations

The findings of this pilot study draw on a small sample that may be subject to selection bias. The individuals who elected to receive this training may have been more likely to have preexisting positive attitudes toward harm reduction and pharmacotherapy, and therefore a lower baseline stigma. Such bias may have translated into smaller changes to stigma survey measures than would be observed in the general population of treatment personnel. Due to the nature of the survey questions, we were also unable to assess results by type of substance use professional, and future research would benefit from determining whether interprofessional variation exists in the effects of educational interventions targeting stigma toward MOUD and harm reduction. We also cannot report a definitive response rate for this study, as our pilot study recruitment methods relied in part on emails sent out by directors of regional state health offices to an unknown number of their substance use prevention staff and affiliates. The study design was also limited by the timing of the post-training survey, which was offered immediately after training completion, and thus cannot speak to longer-term trends in attitudes. The survey included non-validated measures of stigma,

and response options for the outcomes also included a 3-point Likert-type response. More options could provide more detail about changes from pretest to posttest. This may have attenuated the amount of change we observed. Future research should also seek to develop and validate robust measures of stigma toward harm reduction and MOUD that may be used to better measure professional attitudes and planned actions. Finally, while the survey asks about intention to act in stigmatizing ways, such self-reported measures of stigma cannot observe whether behavior change occurred.

Conclusions

Stigma interventions that are virtual and effective offer opportunities for feasible training dissemination and uptake. This pilot study shows promise for using asynchronous online training modules to address attitudinal forms of stigma toward harm reduction and MOUD among the substance use treatment workforce. More research is needed on ways to address broader social drivers of intervention stigma towards harm reduction and pharmacotherapy beyond what education alone may achieve. Such research could examine legal and organizational drivers of stigma, and how to eliminate upstream factors and policies that contribute to stigma. Future research may also build on these preliminary results by using a more rigorous randomized design to investigate the effects of asynchronous online stigma training on observed professional behavior and patient outcomes.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online.

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