Adaptation of the NIDA Standard for delivery via Facebook with justice-involved women in rural Appalachia

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Abstract

Background: Rising rates of intravenous drug use (IDU) in Appalachia have necessitated new approaches to providing risk-reduction interventions in a manner which will be acceptable and accessible to specific at-risk populations—particularly those with limited access to traditional evidence-based interventions. Using the ADAPT-ITT framework, the overall goal of this study is to adapt an evidence-based HIV prevention intervention—the NIDA Standard—to meet the needs of rural drug-using women post-release from jail.

Methods: Through a series of focus groups with rural incarcerated women, theater-testing with members of the target population, and iterative refinements with topical experts, we aimed to identify potential adaptations to content and context to improve the fit, feasibility, and acceptability of the NIDA Standard for this population using social media.

Results: Study findings confirmed the need for a preventive risk-reduction intervention targeting this population post-release. Adaptations to intervention content focused on adding, simplifying, and ensuring continuous access to content in the NIDA Standard. Adaptations to context included modifications to how the intervention will be delivered and by whom, including consideration of unique issues related to delivery using Facebook (such as privacy and confidentiality).

Conclusion: The use of Facebook for delivery of the NIDA Standard may hold promise for increasing reach, acceptability, and feasibility of intervening with rural women with IDU released from jails, particularly when compared with traditional face-to-face sessions. With minor content adaptations to meet participant needs and preferences, plus multiple context adaptations to enhance accessibility and acceptability, the adapted NIDA Standard is intended to retain its original effectiveness while improving important implementation outcomes key to scaling-up and increasing public health impact.

Plain Language Summary

What is known about the topic? Injection drug use rates are high in rural Appalachia, and new approaches are needed to reduce the risk of HIV and HCV among injection drug using women involved in the criminal justice system in this region. While there are effective risk-reduction interventions for HIV and HCV, they are difficult to deliver in rural Appalachia and do not reach the women who need them. What does this paper add? This study describes the use of a systematic approach to improve the “fit” of an evidence-based intervention—the NIDA Standard—with the preferences and perspectives of injection drug using women involved with the justice system, aided by guidance from experts in a specific risk-reduction intervention (the NIDA Standard) and delivery of interventions using Facebook. Changes to the intervention to increase its acceptability and accessibility in this population included shifting delivery of the intervention to a closed Facebook group rather than in person; use of brief videos rather than written text to provide information; use of trusted local women to provide information through videos and Facebook posts; and inclusion of local information on

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community risk factors and resources. Implications for practice, research, or policy: The use of Facebook for delivery of the NIDA Standard holds promise for increasing reach, acceptability, and feasibility of risk reduction among rural injection drug using women released from jails. Next steps include testing the feasibility, acceptability, and effects of the adapted intervention in several rural Appalachian counties.

Keywords
HIV/HCV prevention, women offenders, social media, adaptation

Rural Appalachia has been deeply affected by the ongoing opioid epidemic (Moody et al., 2017; National Association of Counties and Appalachian Regional Commission [NACO/ARC], 2019; Schalkoff et al., 2020), with intravenous drug use (IDU) rates increasing by 12.6% between 2006 and 2012 (Zibbell et al., 2015) and the gap in age-adjusted opioid overdose death rates between Appalachia and the rest of the country widening over time (NACO/ARC, 2019). As IDU has become more prevalent in the region, so have infectious diseases, including human immunodeficiency virus (HIV) and hepatitis C virus (HCV). In the United States, Appalachian states represent 3 of the 10 states with the highest HCV rates, and 5 of the 9 states with the highest number of HCV infections (Rosenberg et al., 2018). Many rural Appalachian counties are considered vulnerable for rapid outbreaks of HIV and HCV (Van Handel et al., 2016), a risk exacerbated by lower utilization of testing and prevention services (Ohl & Perencevich, 2011) and close-knit social networks (Havens et al., 2013; Young et al., 2013).

Rural women in Appalachia bear disproportionate drug-related health burdens, including risk of infectious diseases, due to limited access to services (e.g., Oser et al., 2006; Staton-Tindall et al., 2007; Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality [SAMHSA], 2012). Women drug users, in general, are more likely to have injecting intimate partners, and with fewer economic resources, they are more likely to engage in sex exchange to obtain drugs (Frajzyngier et al., 2007). In addition, women have a faster trajectory from drug use to dependence than men (Greenfield et al., 2010; Hernandez-Avila et al., 2004; Prithwish et al., 2007). These risk factors are even more pronounced in rural Appalachia where women face harsh economic challenges, poverty, and limited health care access. A recent study found that rural drug-using women have extensive injection histories (75%) and high rates of HCV (60%), with most (80%) meeting criteria for substance use disorder (Staton, Ciciurkaite, et al., 2018). The rate of injection in the Appalachian area has grown exponentially in recent years, and qualitative research with rural drug-using women suggests that injection is likely the most common route of drug administration (Staton-Tindall et al., 2015). These risks are exacerbated by rural women drug users’ low perceived severity of infectious diseases, illustrated by comments describing HCV as “as common as a bad cold around here” and “not that big of a deal, everybody’s got it” (Staton-Tindall et al., 2015).

Delivering preventive interventions to injection drug-using rural women is challenging due to few treatment sites, lack of public transportation, and insular social networks (Friedman, 2003). Our program of research has targeted a setting where rural women who use drugs can easily be identified: rural jails, which house a high number of individuals who use drugs and are rarely identified or treated (e.g., Leukefeld et al., 2012; Staton, Strickland, et al., 2018; Staton-Tindall et al., 2007; Staton-Tindall et al., 2015). The lack of health and behavioral health services in rural jails is well-documented (NACO/ARC, 2016) and exemplifies the need to increase the reach of preventive interventions targeting this population, not only during incarceration but also post-release.

The NIDA Standard

Evidence-based interventions (EBIs), such as the NIDA Standard Intervention Model for Injection Drug Users Not in Treatment (henceforth “NIDA Standard”), have been developed to reduce the risks of IDU and associated sexual behaviors. The NIDA Standard was developed through large, multisite cooperative agreement trials aiming to encourage adoption of HIV prevention practices among high-risk injectors (e.g., Coyle et al., 1998). Designed to be delivered in face-to-face sessions by a trained interventionist (typically an outreach worker, counselor, or health educator), the NIDA Standard includes didactic content focused on reducing high-risk practices like shared needle use, increasing safe sex practices including the use of latex condoms, and emphasizing the importance of drug treatment (Wechsberg et al., 1995). In two sessions (approximately 20–30 min each in duration), the interventionist meets with a program participant and delivers risk-reduction messages; introduces practice of risk-reduction skills (e.g., cleaning injection equipment, talking about practicing safe sex with a partner) through modeling and rehearsal; reinforces behavior change efforts; and provides referrals to treatment, if indicated. Interventionists are guided by 24 cue cards and scripts developed to standardize intervention delivery (Wechsberg et al., 1995). Since its development, the NIDA Standard has been tested in a series of randomized controlled trials with evidence of decreased high-risk drug and sexual behaviors among diverse drug users, including women and incarcerated individuals (e.g., Booth et al., 1998; Cottler et al., 1998; Dushay et al., 2001; Martin et al., 2003; Surratt & Inciardi, 2010; Surratt et al., 1998; Wechsberg et al., 2004).
The Appalachian context: challenges and potential solutions

Implementation of EBIs like the NIDA Standard is challenging in the rural Appalachian context, however. Availability and acceptability of EBIs are limited in the Appalachian region for multiple and multilevel reasons: shortages of primary care and mental health providers (Health Resources & Services Administration [HRSA], 2021); rural providers who are less likely to use EBIs compared with their urban counterparts (Dotson et al., 2014); Appalachian stereotypes (e.g., fatalism, homogeneity) undermining patient–provider relationships (see Hansen & Resick, 1990); and poverty of economic resources in many communities (Zhang et al., 2008). Some Appalachian residents report distrust of medical and mental health professionals and perceived stigma of mental health and substance use treatment (Coyne et al., 2006; Zhang et al., 2008), presenting additional barriers to the traditional delivery approaches for EBIs like the NIDA Standard. Because many women with histories of substance use become involved in the justice system, local rural jails in Appalachian communities have been identified as critical venues for outreach and intervention (Leukefeld et al., 2012). Our previous work demonstrated positive effects of the NIDA Standard when delivered to this population during incarceration (Staton, Strickland, et al., 2018), suggesting that if challenges to access and acceptability could be overcome, this EBI may also serve as an effective preventive intervention post-incarceration—especially vital during the period of heightened risk associated with community re-entry (Woods et al., 2013).

Telehealth approaches—specifically using social media—have been proposed as a potential tool to respond to the substance abuse crisis in rural Appalachia (Moody et al., 2017). With the “use of telecommunications and virtual technology to deliver health care outside of traditional health-care facilities” (World Health Organization [WHO], 2021), telehealth has the potential to reach groups for whom in-person services may not be accessible (Schafer et al., 2017). Telehealth delivery of risk-reduction interventions for HIV and other diseases through social media platforms have recently been tested, and results are promising (Cao et al., 2017; Guse et al., 2012). Social media has been used to deliver sexual health interventions (Bull et al., 2012), to increase HIV testing among LGBTQ (lesbian, gay, bisexual, transgender, and questioning) populations (Rhodes et al., 2016), and to reduce HIV risk among young men who have sex with men (Lelutiu-Weinberger et al., 2015). However, most social media-based interventions to date have targeted urban adolescents or sexual minority groups. While the most recently available data demonstrate that broadband access in rural Appalachia continues to lag behind more urban areas (68% of rural Appalachian households versus 81% of U.S. households; ARC et al., 2020), telehealth interventions in rural Appalachia have been successfully implemented and sustained for both physical and mental health screening and treatment (Campbell et al., 2014; Franko, 2014), and a recent study identified the frequent use of Facebook by almost two-thirds of rural drug-using adult women following release from jail (Dickson et al., 2017).

Rationale for adaptation of the NIDA Standard

As described by Baumann and Cabassa (2020), an equity lens to implementation science requires that interventions with vulnerable populations and low-resource communities be selected and adapted with reach, feasibility, acceptability, and reduction of inequities in mind. From this perspective, the needs and resources of the intended recipients must be considered in intervention development, selection, adaptation, and implementation. Thus, in rural Appalachia, attention to stakeholder preferences and regional characteristics relevant to preventive intervention for substance use and sexual health may increase intervention acceptability, engagement, and effects (Moody et al., 2017).

Adaptation—the intentional modification of existing EBIs to new contexts and target populations—is a vital focus of implementation science (Cabassa & Baumann, 2013; Chambers & Norton, 2016; Stirman et al., 2013). As described in recent scoping reviews by Escoffery et al. (2019) and Movsisyan et al. (2021), numerous adaptation frameworks and approaches have been described and used in the implementation science literature, most consisting of some combination of broadly categorized steps: (1) determining the need for adaptation; (2) involving stakeholders, including members of the target population and experts in the EBI; (3) systematically deciding upon adaptations; (4) obtaining stakeholder feedback on proposed adaptations; (5) iterative testing and revising of adaptations; and (6) finalizing, implementing, and evaluating the adapted EBI for implementation outcomes and/or effectiveness. The ADAPT-ITT model (Wingood & DiClemente, 2008) was developed in the HIV field as a sequential process steeped in community engagement and has been used to adapt risk-reduction interventions related to substance use and sexual health (e.g., Barkan et al., 2014; Sullivan et al., 2014). The cultural adaptation origins of ADAPT-ITT (Castro et al., 2004) make it particularly relevant for our work with rural Appalachian women. In the current study, we focus on the first six of the eight ADAPT-ITT phases, in which we systematically engaged members of the target population and topical experts in decisions regarding the need for and types of adaptations to be made to the NIDA Standard.

Implementation outcomes (e.g., reach, adoption, acceptability) are key targets in determining the need for adaptations (Baumann et al., 2017). While multiple classifications of the types of adaptations made to EBIs have
been proposed (e.g., Perez Jolles et al., 2019; Resnicow et al., 2000), we relied on Stirman and colleagues’ (2013) categorization of modifications to either content or context in understanding and designing adaptations with the dual goals of increasing accessibility and acceptability of the intervention. Modifications to content can include adding or removing elements, reordering, shortening or lengthening, and integrating approaches; according to Stirman et al.’s framework, these may be more likely to change the effectiveness of an EBI, and thus should be made with caution. In contrast, modifications to context include changes to the intervention setting, format or channel of delivery, personnel delivering the intervention, or the target population. We considered these classifications in the early stages of the ADAPT-ITT process, allowing us to systematically evaluate the need for and potential implications of adaptations in consultation with topical experts and members of the target population.

Study aims

Rising rates of IDU in Appalachia have necessitated new approaches to providing risk-reduction interventions in a manner which will be acceptable and accessible to specific at-risk populations—particularly those with limited access to traditional EBIs. This study completed the first six phases of ADAPT-ITT to systematically adapt the NIDA Standard to meet the needs of rural drug-using women post-release from jail. We aimed to identify potential adaptations to content and context to improve the fit, feasibility, and acceptability of the NIDA Standard for this population using Facebook, in preparation for subsequent testing.

Method

ADAPT-ITT Phases 1–3: assessment, decision, and administration

The goal of the first three phases of ADAPT-ITT is to explore the perspectives of the target population regarding their need and preferences for intervention, as well as whether adaptations to an original EBI may be needed. In this project, we specifically sought perspectives on intervention delivery via social media, given the known barriers and contextual challenges to traditional in-person delivery of the NIDA Standard in rural Appalachian communities.

Participants. Three focus groups (N=19) were conducted in summer 2018 at two rural jails in Appalachian Kentucky. Incarcerated women were randomly selected from jail rosters on the day of each focus group and invited to a group informational and eligibility screening session at the jail. Eligible individuals reported injection drug use in the last 6 months, at least one risky sexual behavior in the last 6 months, self-reported HIV negative status, projected release in the next 3 months, and regular Facebook use before incarceration (i.e., at least once per week). The study was described to all eligible and interested individuals, including the purpose of the focus group and risks and benefits of participation, with a particular focus on confidentiality. Following the study description, interested individuals provided their written informed consent to participate and stayed for the focus groups, which were conducted immediately after the informational screening sessions. Data were not collected on participants who were not interested in staying for the groups. All participants were White adult women who met the inclusion criteria; because non-Hispanic White individuals comprise nearly 95% of rural central Appalachian residents (ARC et al., 2020), these demographic characteristics were consistent with the region. Due the sensitive nature of the focus group topic and the researchers’ arrangements with each jail, other sociodemographic data were not collected to preserve participant privacy given their status as incarcerated individuals.

Procedures. All study procedures were approved by the University of Kentucky Institutional Review Board. Focus groups were conducted in a private room within the jail with no one present except participants and facilitators. Facilitators included the study principal investigator (PI) and two study coordinators; the PI is a doctoral-level social worker by training and a professor at the University. Both coordinators were students in human services degree programs. All three were White women and the coordinators were both from rural Appalachia. Participants and facilitators did not meet before the study, and participants’ knowledge about the research was limited to the information provided prior to and during informed consent. During informed consent, the PI provided a rationale for the study and her interest in enhancing HIV/HCV education and prevention information for women in the community. She moderated the focus group discussions while study coordinators took process field notes. Each focus group lasted approximately 1 hr, and with participant permission, discussions were digitally audio-recorded and transcribed verbatim, redacting all identifying information. Due to the confidential nature of the jail setting and protections for human subjects, there were no additional follow-ups with focus group participants for member checking, and transcripts were not returned to participants for additional comments. Our analytic approach focused on prominent themes regarding intervention delivery via Facebook, rather than attempting to represent lived experiences of participants in ways meant to reflect their realities; this caveat and the requirement to minimize contacts with incarcerated participants made member checking both unnecessary and undesirable in this study (Thomas, 2017).

Measures. A semi-structured interview guide was developed with questions addressing four primary topics: (1) sources of
health-related information; (2) use of social media, including participants’ social media access, frequency of use, and preferred content; (3) types of content participants would be comfortable learning about and discussing on social media, including risky drug use and/or sexual behaviors; and (4) willingness to participate in a HIV/HCV risk-reduction intervention on social media. Concerns about confidentiality and privacy on social media were addressed via probes throughout the focus group discussions. Given prior research suggesting high levels of distrust of medical professionals in rural Appalachian communities (Coyne et al., 2006; Zhang et al., 2008), participants were also asked about sources of health information more generally, including how they find health information, what topics they want more information about, and who they trust to deliver health information.

Qualitative data analysis. Directed content analysis methods were used (Hsieh & Shannon, 2005), wherein theory or prior research is used to construct a preliminary set of codes, with secondary or sub-codes emerging during the coding and codebook revision processes. Preliminary codes were organized around Stirman et al.’s (2013) context/content framework. Two coders independently created a list of possible sub-codes categorized within this framework based on a review of transcripts, then refined codes through iterative discussion with the full study team. These codes were then applied independently by each coder to test portions of the transcripts until at least 80% coding agreement was reached. Codes were applied to transcripts using ATLAS.ti 8 software. By the third focus group, “code saturation” (vs “meaning saturation”) was achieved, meaning no additional codes or subcodes were identified (Guest et al., 2017; Hennink et al., 2019). Final classification of themes was achieved via consensus of the full research team.

Planning adaptations. Themes identified through qualitative analyses were reviewed by the full research team for consistency with the original NIDA Standard intervention. Over multiple team meetings, adaptations were proposed and selected in response to themes identified from focus group discussions, aiming to increase the intervention’s fit to the new target population and context.

ADAPT-ITT Phases 4–6: production, topical experts, and integration

The adaptation process progressed through development of a “beta” version of the adapted intervention incorporating proposed changes to the NIDA Standard; theater testing of the “beta” version with members of the target population naïve to the intervention; consultation with topical experts in the original intervention (i.e., a researcher involved in the development and testing of the NIDA Standard) and in delivery of EBIs through social media; and final refinement of modifications.

Participants. A “beta” version of the adapted intervention was theater-tested with members of the target population (N=4) who had not participated in earlier phases of the project. Participants were rural adult women with a history of justice involvement who had participated in previous studies and provided consent to be contacted about future research. Participants from the earlier focus groups were not eligible to participate in theater testing.

Procedures. Prior to theater-testing, a draft of the new intervention manual and content was developed based on the themes identified from the earlier focus groups. Participants were invited to visit the study field office for the theater test. Four of six invited individuals who initially expressed interest attended. For the theater test, participants viewed the content and interactive layout of the study Facebook page via projection from a computer, including posts developed for each section of the NIDA Standard. Specific questions were posed to the group related to content (e.g., video and text topics and content) and context (e.g., perceptions of the individuals providing the intervention content in videos; acceptability of the “closed group” format). Participants’ responses were audio-recorded, transcribed, and presented in full to the research team and topical experts to guide additional refinements to the “beta” intervention. Topical experts provided guidance to the research team regarding (1) consistency of proposed adaptations with the original NIDA Standard and (2) feasibility and logistical considerations related to Facebook delivery of the adapted intervention.

Final adaptations. While ADAPT-ITT phases are presented linearly, in practice an iterative, recursive approach was required to collect information from the target population, analyze and present results to the full research team, obtain guidance regarding proposed modifications from the perspectives of topical experts, and design adaptations to meet the needs and preferences of the target population while retaining core content of the original intervention. The sixth ADAPT-ITT phase—integration—involved close review of each stage of target population feedback obtained (i.e., from initial focus groups through theater testing) with respect to each proposed adaptation, with checks on feasibility of Facebook delivery and fidelity to the original intervention content accomplished through detailed reviews of adaptations with topical experts.

Results

ADAPT-ITT Phases 1–3: assessment, decision, and administration

Summaries of key themes from focus group participants are presented. The final list of primary and sub-codes is presented in Table 1.
Health information and services. In describing their preferred sources of health information and awareness of local health services, most participants were unaware of services available beyond needle exchanges, which were not offered in all counties. Participants were aware of health-related services available through local agencies (e.g., health insurance enrollment), but found them inadequate: “I think they should provide better health care. Just because you’re a drug addict . . . your plan should help you better.”

Many participants indicated that the internet was their first, and often preferred, source for health information. Several described a lack of knowledge about existing supports in the context of community re-entry, emphasizing the importance of accessible interventions for this population. In general, participants were aware of few, if any, local resources for risk-reduction interventions, and many described relying on online health information.

Intervention content. Regarding risk-reduction health topics, participants were receptive to information included in the original NIDA Standard about condom use and other methods of preventing sexual transmission of HIV; safe practices for injection drug use, including cleaning needles; and information about HCV and HIV transmission, testing, and treatment. Several participants voiced particular concerns about HIV and HCV transmission, expressing fears about potential exposures in their communities with statements such as “Scared to death of that Hep,” or “My big fear is about HIV because it’s become a lot more common than you would believe.” While many participants were confident that they understood HIV transmission and risks, HCV seemed to be less well-understood, though participants correctly believed it to be highly prevalent: “I’m terrified that HIV is gonna come here. [Facilitator: Cause you feel like that’s a bigger deal than Hep C?] Oh yeah, Hep C’s like the common cold around here.”

Although the content of the original NIDA Standard aligned well with participants’ prioritized health topics, the need for local information, tailored to individual communities, was expressed by several participants. For example,
if the benefits of needle exchange were addressed, participants wanted to know the location and hours of their local program. Similarly, if protection provided by male condoms was described, they wanted information about where to get free condoms locally; if regular testing for HIV and HCV was emphasized, they wanted to know what local organizations offered testing. Participants were also interested in information about the local prevalence of diseases, beyond state or national data.

**Facebook use.** Regarding social media, nearly all participants identified Facebook as their most frequently used platform. Participants overwhelmingly agreed that they used Facebook every day, multiple times a day (“every hour; all the time,” “all day, every day”). While other social media platforms were mentioned (e.g., Snapchat and Instagram), Facebook was the clearly preferred platform. Participants mentioned the range of content available on Facebook (e.g., videos, photos, quizzes, or memes), its versatility for communication, and the fact that it was used ubiquitously: “My people are always online. Always. If they are not online, they are probably in here [jail].” Facebook was also described as a tool for learning, including researching health information, or as a means to find drugs or clients for services such as hairdressing or transactional sex. Most participants were familiar with groups on Facebook, particularly groups for selling or buying items, recovery groups, and family groups. Some participants were familiar with the use of “private” or “closed” groups.

**Facebook for intervention delivery.** Participants generally agreed a risk-reduction intervention delivered via Facebook would be helpful and accessible. They reported frequent “scrolling” throughout the day and acknowledged that they would be likely to read or view content if it were available to them, particularly if presented as interactive quizzes, memes, and videos: “And if you’re doing nothing? Eventually you’re gonna start reading them articles. You don’t really care about what you’re reading anyway, so might as well read this article about hepatitis.”

With regard to the source of intervention content shared via Facebook, participants were divided among those preferring to interact with an “expert,” such as a physician, and those preferring information from others who have been through similar experiences (“somebody you, like, relate to”). A common theme was that of trust: trusting university staff with a known presence in the community, trusting “another addict,” and trusting individuals with experience and expertise.

Finally, given the potentially sensitive content of the original NIDA Standard, concerns about privacy and confidentiality on the Facebook platform were discussed. Most participants were familiar with privacy settings on Facebook. Nonetheless, there was general consensus that Facebook was not private or confidential. Participants described experiences of others accessing their accounts, either with their knowledge (e.g., family members) or without (e.g., being hacked by unknown people or significant others). For some, maintaining privacy on Facebook was difficult because they were constantly logged in on their phones, or because they were tagged in unwanted posts by others. The majority of discussion around challenges of using Facebook as a social media platform centered on concerns of privacy and confidentiality, particularly regarding the exposure of private or embarrassing activity to others.

Mitigating some of these concerns, most participants described censoring their own posts to protect their privacy: “Well, I think if I’m gonna post it, it’s not something I care if anybody sees.” Some noted that they used Facebook Messenger to communicate privately about sensitive topics, but most expressed comfort using Facebook pages to share information about children and family members and to post about their recovery and health.

To several participants, privacy settings did not eliminate the risk of using a Facebook group for intervention delivery. Participants observed that membership in the group, even without actively posting or interacting on the group page, could reveal their IDU, which might be problematic in a context where participants could not select or screen other group members: “They could still see your picture and things like that. People are gonna know who you are.” Participants with privacy concerns stated they would be more comfortable if members could be hidden from other members, if they had a choice whether or not to interact with posts, or if intervention content could be delivered via Facebook Messenger.

**Planned adaptations.** Based on the themes described above, the research team identified an initial set of adaptations intended to respond to participant preferences and offer the NIDA Standard intervention via Facebook, aiming to increase access and acceptability in the target population. Initial proposed adaptations included two adaptations to context and one adaptation to content, respectively: (1) establishing a “closed group” for intervention delivery on Facebook, managed by the research team; (2) using a combination of text and video posts to provide NIDA Standard content (based on the cue cards included in the original intervention; Wechsberg et al., 1995); and (3) posting additional information about HCV, local resources, and relevant community activities on the group page. Intervention content was planned to be posted sequentially over time, parallel to the original NIDA Standard two-session topic-by-topic curriculum.

**ADAPT-ITT Phases 4–6: production, topical experts, and integration**

Theater test results and consultation with topical experts were used to refine the initial set of adaptations. Target
population members’ responses to the “beta” version of the intervention prompted additional adaptations to context, including the development of brief video vignettes demonstrating specific risk-reduction strategies (e.g., cleaning equipment); and the use of trusted, local Appalachian women as information sources, demonstrating and explaining strategies in the videos and posting additional information on the Facebook group page. The NIDA Standard topical expert informed the following adaptations to context and content: video demonstration of risk-reduction strategies originally guided by cue cards; maintaining videos and posts on the group page continuously rather than presenting content “session by session”; editing language to reduce jargon and medical terminology used in the original intervention; and ensuring coverage of core content. The topical expert on intervention delivery via Facebook informed adaptations to context, including “closed group” privacy settings to protect participants, and use of brief videos, very limited text, and interactive links to promote engagement with intervention content. Following this iterative process integrating data from focus groups, theater testing, and topical experts, the final set of adaptations to content and context was completed (see Table 2).

**Table 2. Adaptations to the NIDA Standard, including sources and examples.**

| Adaptation                                  | Type       | Source                              | Description                                                                                                                                                                                                 |
|---------------------------------------------|------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Facebook-delivery via closed group          | Context    | Target population                   | Based on focus group concerns about privacy and confidentiality and topical expertise regarding Facebook intervention delivery, the adapted NIDA Standard is designed for delivery within a closed Facebook group (i.e., individuals must receive and accept an invitation to join the group from a group administrator) |
| Use of video demonstrations                 | Context    | Target population                   | Video demonstration of specific risk-reduction activities (e.g., cleaning equipment) is used in place of the original NIDA Standard cards                                                                                                                                     |
| Limited use of written text                 | Context    | Topical experts                     | In place of blocks of text used in the original NIDA Standard cards, brief text, links, and videos are provided to promote engagement with intervention content                                                                                                                |
| Local presenters                            | Context    | Topical experts, target population  | Presenters who are filmed in videos and who post to the Facebook closed group are women from Appalachian Kentucky who are familiar with the target population                                                                                                          |
| Content continuously available              | Content    | Topical experts                     | Rather than presenting NIDA Standard information in a sequence of one-time sessions, posted information remains available on the closed group Facebook page continuously                                                                                        |
| Language adjusted to address literacy        | Content    | Topical experts                     | Jargon and medical terminology are limited and replaced with layperson’s language at approximately an 8th grade reading level                                                                                                                                         |
| Local resources and services shared         | Content    | Target population                   | Local information about resources, services, and relevant activities is regularly shared on the closed group Facebook page                                                                                                                                           |

Discussion

New strategies to increase the accessibility and acceptability of effective risk-reduction interventions are urgently needed in the face of rising rates of IDU in central Appalachia. Despite engaging in high-risk behaviors like IDU and unprotected sex, rural drug-using women released from jails do not typically receive EBIs to reduce their risk for HIV and HCV (Bronson et al., 2017; Leukefeld et al., 2012); further, specific characteristics of this target population and their context make “usual delivery” of many EBIs especially challenging (NACO/ARC, 2016). In response to these needs, the purpose of this study was to identify potential adaptations to intervention content and context to improve the fit, feasibility, and acceptability of the NIDA Standard with this underserved and at-risk population.

In the field of implementation science, it is widely recognized that EBIs are rarely, if ever, delivered as originally designed in “real world” settings (Baumann et al., 2017; Castro et al., 2004; Chambers & Norton, 2016; Stirman et al., 2013). While adaptations are sometimes made reactively in response to contextual factors and implementation challenges, planned adaptation approaches can anticipate and adjust for the needs and preferences of target populations, communities, and agencies in advance, increasing the fit of EBIs to new settings and new populations (Baumann et al., 2017). The need for adaptation is heightened when existing EBIs are not available to populations experiencing disproportionate burden of risk factors or negative health outcomes (Baumann & Cabassa, 2020)—such as the inequities in drug-related health burdens among rural IDU women in Appalachia (Oser et al., 2006; SAMHSA, 2012; Staton-Tindall et al., 2007). Guided by the ADAPT-ITT framework, we aimed to increase access to the evidence-based NIDA Standard among rural IDU women being released from jail, identifying multiple adaptations to the intervention’s content and context. Ongoing consultation with topical experts maximized fidelity to the content of the original NIDA Standard while modifying aspects of intervention delivery to meet the preferences of the target population.

Most challenges associated with providing the original NIDA Standard to rural women being released from jail relate to the accessibility and acceptability of intervention
delivery. Based on input from members of the target population and topical experts, recommended adaptations to NIDA Standard content were few; participants were receptive to the health information in the original intervention, so content adaptations were limited to including locally relevant information (including an increased focus on HCV), adjusting language for literacy and regionality, and maintaining continuous (rather than sequential) access to intervention content online. All remaining adaptations were to context—the types of adaptation thought to pose less of a threat to the integrity, effects, and fidelity of an EBI (Stirman et al., 2013). The major adaptation made was to shift from in-person session delivery to Facebook. Internet-based delivery of risk-reduction interventions for rural populations has been recently advocated to overcome major barriers to traditional intervention delivery (Moody et al., 2017), highlighting the timeliness of this effort. We expect that the selected adaptations will enhance the accessibility and acceptability of the adapted NIDA Standard among this new target population.

Limitations

The primary limitation of most qualitative research is its lack of generalizability beyond the participants included in the study. While this limitation applies to the current study, our rigorous methods and reliance on a systematic framework to guide adaptations enhance the reliability and generalizability of our methods. Our relatively small sample size, particularly in the group of participants involved in the theater test, is another study limitation; the feedback provided by members of the target population in response to the theater test may have been more robust with a larger group. The next phase of our research involves pilot testing and debriefing participants on the feasibility and acceptability of the adapted intervention, which will provide opportunities for further refinement. The pilot testing phase will also allow us to investigate determinants of intervention use (e.g., participant age and other characteristics) that were not assessed in the current study. Finally, as with all interventions using digital platforms, advances in technology and changes in social context may influence the uptake of interventions associated with specific platforms (e.g., use trends may shift to other applications, reducing the reach of an intervention delivered via Facebook; see Moreno & D’Angelo, 2019). While this study proposed Facebook as an appropriate platform for adapted NIDA Standard delivery, the literature on social media delivered interventions is growing (Moreno & D’Angelo, 2019; Pagoto et al., 2016), and future innovations and social shifts may prompt changes to our (or any digital intervention’s) platform selection.

Conclusion and future directions

The opioid crisis and its disproportionate effects on rural women demand novel strategies to intervene with those at risk to improve their long-term outcomes. Using an implementation science approach, we completed an iterative process of intervention adaptation with the overarching goal of increasing the public health impact of this EBI, particularly reaching those with some of the most challenging barriers to accessing evidence-based services. The Facebook-delivered adapted NIDA Standard holds promise for increasing the reach, acceptability, and feasibility of intervening with rural, IDU women released from jails, particularly when compared with traditional face-to-face intervention delivery.

These results address the first six phases of the ADAPT-ITT framework. Next, we will complete the final two ADAPT-ITT phases: Training and Testing. These phases will involve training of interventionists to monitor Facebook intervention delivery and a pilot-test of the adapted NIDA Standard with a sample of IDU women upon their release from jails in several rural central Appalachian counties in eastern Kentucky.

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