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## Using the Exploration-Preparation-Implementation-Sustainment (EPIS) Framework to Prepare for the Implementation of Evidence-Based Practices into Adolescent HIV Settings

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### Abstract

Despite advances in evidence-based practices (EBP) to support HIV prevention and treatment, youth ages 13–24 experience significant disparities in HIV risk and outcomes. An important factor in this disparity is poor EBP implementation, yet implementation research is limited, particularly in youth-serving settings. This study used the Exploration, Preparation, Implementation, Sustainment (EPIS) framework to guide the implementation of four Motivational Interviewing (MI) and MI-framed interventions into youth-serving HIV prevention and treatment settings. Key stakeholders (n=153) across 13 sites completed pre-implementation interviews. Stakeholders' comments identified two critical factors for effective implementation: fit with the patient population and provider receptivity, including concerns about scope of practice, buy-in, and time. Stakeholders recommended strategies for structuring training, fidelity monitoring, and

#### Authors' contributions

April Idalski Carcone, EPIS Project study co-lead, conceived of the research question for this paper, oversaw data coding, conducted all data analyses and interpretation, and wrote the initial draft of the manuscript. Karin Coyle, EPIS Project study co-lead, assisted with data interpretation, read manuscript drafts, and provided feedback. Seyram Butame coded data, read manuscript drafts, and provided feedback. Gary W. Harper read manuscript drafts and provided feedback. Gregory A. Aarons is co-developer of the EPIS framework and consulted on the EPIS Project study conceptualization, read and edited manuscript drafts, and provided feedback. Sylvie Naar, Scale It Up Study Principal Investigator, read manuscript drafts and provided feedback.

#### Conflicts of Interest

The authors declare that they have no conflicts of interest.

#### Ethics approval

This study was initially approved by the Wayne State University Institutional Review Board. Institutional regulatory oversight was transferred to Florida State University.

#### Consent to participate

All study participants provided informed consent prior to participating in study activities.

#### Consent for publication

All study participants provided informed consent prior to participating in study activities regarding publishing their data

facilitating implementation including engaging informal leaders, collaboratively developing the implementation strategy, and site-wide implementation. Results highlight the importance of pre-implementation contextual assessment and strategic planning for identifying provider concerns and developing responsive implementation strategies.

## RESUMEN

A pesar de los avances en las prácticas basadas en evidencia (EBP, por sus siglas en inglés) para apoyar la prevención y el tratamiento del VIH, los jóvenes de 13 a 24 años atraviesan disparidades significativas en el riesgo y los desenlaces del VIH. Un factor importante en esta disparidad es la implementación deficiente de las EBP, aunque la investigación sobre la implementación es limitada, particularmente en entornos que atienden a jóvenes. Este estudio utilizó el marco de Exploración, Preparación, Implementación, Mantenimiento (EPIS) para guiar la implementación de cuatro entrevistas motivacionales (MI) e intervenciones enmarcadas en MI en entornos de prevención y tratamiento del VIH que atienden a jóvenes. Las partes interesadas clave (n=153) en 13 sitios completaron las entrevistas previas a la implementación. Los comentarios de las partes interesadas identificaron dos factores críticos para una implementación efectiva: idoneidad para la población de pacientes y receptividad de los proveedores, incluidas las preocupaciones sobre el alcance de la práctica, la aceptación y el tiempo. Las partes interesadas recomendaron estrategias para estructurar la capacitación, monitorear la fidelidad, y facilitar la implementación, incluyendo la participación de líderes informales, el desarrollo colaborativo de la estrategia de implementación y la implementación en todo el sitio. Los resultados destacan la importancia de la evaluación contextual previa a la implementación y la planificación estratégica para identificar las preocupaciones de los proveedores y desarrollar estrategias de implementación que respondan a ellas.

## Keywords

implementation science; adolescent; evidence-based practices; EPIS framework

## INTRODUCTION

In the United States, rates of undiagnosed HIV are the highest among young (ages 13–24) men with male-to-male sexual contact (MMSC) with just over half (55.1%) of new HIV infections diagnosed in 2019 [1]. Young men living with HIV have the poorest rates of linkage to care (44.6%), retention in care (32.7%), and viral suppression (35.3%) of all age groups [2]. Among those contracting HIV through MMSC, linkage to care (65.9%), retention in care (49.7%), and viral suppression (57.7%) rates are better [2], but remain below levels necessary to achieve national goals [3]. Pre-exposure prophylaxis (PrEP) rates are similar; 23.4% of those eligible for PrEP have coverage but youth have the lowest rate of PrEP coverage (15.6%) [2]. Thus, it comes as no surprise that HIV transmission rates among those 13- to 24-years old (5.1 per 100 person-years) and MMSC (4.4 per 100 person-years) are much higher than population-level transmission rates (3.5 per 100 person-years) [4]. These data highlight the disparity in HIV risk and health outcomes for both youth and MMSC.

One factor in the disparate experience of youth and MMSC is poor implementation of evidence-based interventions and treatment innovations (commonly referred to as evidence-based practices, or EBPs) into HIV prevention and treatment settings [5]. To illustrate, despite evidence for the effectiveness of PrEP in reducing HIV transmission, a recent meta-analysis highlighted multiple provider-level factors limiting PrEP implementation including discrepancies between provider willingness to prescribe PrEP and actual prescribing practices as well as variation in PrEP implementation across health care specialties and provider types [6]. For those living with HIV, adherence remains the primary obstacle to optimal outcomes among those engaged in treatment [7]. Electronic health (eHealth) interventions demonstrate great promise in improving outcomes across the HIV treatment cascade, yet most interventions have stalled in the pilot or efficacy phase of research and no eHealth intervention has been implemented widely [8]. Findings such as these have spurred the National Institutes of Health to make implementation science, the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings [9], a HIV research priority [10] and to fund 216 HIV implementation research studies between 2013 and 2018 [11].

While there has been a growing emphasis on implementation science in HIV, it remains a developing field. To date, HIV implementation studies have focused on contextual inquiry, examination of the context into which an intervention will be implemented [12], including characterizing features of the implementation context [6,13,14] and assessing barriers and facilitators [15,16] in preparation for implementing an intervention. Studies that assessed implementation outcomes have largely examined pilot-level outcomes, such as intervention feasibility and acceptability [17], with scant attention to sustainability [8,11]. Regardless of focus, few studies have used an implementation model, theory, or framework to guide their work [11,17]. Further, implementation studies typically focus on a single setting and/or a single EBP thereby limiting their generalizability [18].

The current study uses the Exploration, Preparation, Implementation, Sustainment (EPIS) implementation framework [19,20] to prepare for the implementation of four EBPs. EPIS conceptualizes implementation as occurring across four phases [19,20]. The *Exploration* phase involves the recognition of a concern or opportunity for improvement and the examination of EBPs that might fill this gap. In *Preparation*, there is a decision to adopt an EBP to address the identified gap and to develop an implementation plan that addresses perceived barriers and leverages potential facilitators. *Implementation* refers to the active integration of the selected EBP into routine care with ongoing monitoring and modification of the implementation plan to support success. *Sustainment* examines the continued use of the new EBP with an emphasis on ongoing monitoring and support. Across these phases, factors within the implementing organization (i.e., the *inner context*, such as organizational leadership and clinician characteristics); outside the implementing organization (i.e., *outer context*, including the service context, policy environment, and EBP consumer populations); and the relationships between individuals and organizations that *bridge* the inner and outer contexts influence the implementing organization's uptake of the EBP. Features of the EBP itself (i.e., *innovation factors*, such as the EBP's fit within the service system and target population) are also important factors affecting implementation. The EPIS framework has been used to study the implementation of EBPs in child welfare [21–23] and juvenile justice

systems [24], child and adolescent mental health [25], and school-based implementation [26]. A dominant framework among the National Institutes of Health's Centers for AIDS Research (CFAR), EPIS has been used to characterize various implementation contexts in HIV (e.g., PrEP provision [6] and linkage and retention in HIV clinical care [27]) as well as to develop (e.g., delivery of mental health services to adolescents living with HIV in sub-Saharan Africa [28]) and assess the effectiveness of implementation strategies (e.g., the integration of substance use intervention services into HIV treatment settings [29]).

This study was conducted as part of "Scale it Up," an Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) research program [30]. Four interventions for young gay, bisexual, and men who have sex with men (Y-GBMSM) were implemented across 13 HIV prevention and treatment-providing sites. All involved the use of Motivational Interviewing (MI), a client-centered yet directive method of engaging individuals in behavior change conversations [31]. MI is supported by a strong evidence base spanning multiple domains, behaviors, disciplines, populations, and contexts [32–34]. MI's demonstrated success in HIV prevention and care has distinguished it as the only EBP effective with youth living with HIV leading to it being embedded in HIV clinical and prevention guidelines [30]. Furthermore, in a prior ATN funding cycle (i.e., the EPIS *exploration* phase for the current trial) site leaders and study coordinators confirmed MI was the favored EBP in HIV. Scale It Up (SIU) interventions included ATN 146 Tailored Motivational Interviewing (TMI) [30], which aimed to integrate the use of MI across adolescent HIV prevention and clinical care settings. ATN 145, the Young Men's Health Project (YMHP) [35], was a 4-session intervention grounded in MI to reduce the risk of HIV infection among Y-GBMSM delivered in clinic or by telephone. ATN 156, We Test [36], was an adaptation of YMHP that involved an adjunctive treatment to enhance communication skills among Y-GBMSM prior to the initiation of couples' HIV testing and counseling. ATN 144, referred to as SMART for "sequential multiple assignment randomized trial" [37], was an adaptive intervention in which youth living with HIV were initially randomized to MI-framed cell phone support to increase antiretroviral therapy adherence or short message service text message medication reminders; after three months youth were re-allocated based on viral load. The goal of the current study was to understand implementation stakeholders' perceptions of the issues associated with implementing these SIU EBPs prior to actual implementation, that is, during the EPIS *preparation* phase.

## METHODS

This study is part of a larger implementation study using a convergent parallel (or concurrent triangulation) mixed methods longitudinal design (ATN 153, EPIS [38]). Participants completed a telephone interview and an electronic survey to assess their perceptions of the factors impacting the implementation of the four MI and MI-based interventions described above within their clinical sites three times: as they *prepared* for implementation, after *implementation*, and one-year later as sites prepared for *sustainment*. This study reports on interviewees' perceptions of implementation barriers and facilitators during the preparation phase of the study. Survey data were reported in a prior publication [14] and are discussed in the context of the current findings in the discussion section. A subset of the qualitative data, interviewer summaries of 97 TMI interviews from 10 sites, was previously reported

[15]. This study builds upon this work by examining transcribed interview data from 153 stakeholders reporting on all four of the interventions to be implemented as part of the SIU research program.

## Participants

All medical providers and staff located within 13 ATN sites (Table 1) were eligible and invited to participate. ATN sites included both medical clinics providing medical care to people living with HIV and prevention centers providing HIV testing and outreach services. Medical providers were those with direct patient interaction across several points of care, including prevention, counseling and testing, linkage to care, HIV primary care, services to promote retention and adherence to medications, and other medical or psychosocial services. Staff included administrators with key decision-making roles and input on service delivery and site operations (e.g., Division Chief, Clinic Director) and others supporting clinical operations (e.g., Research Coordinators). Each site identified a clinical leader (the “Site PI”, i.e., Site Principal Investigator) to represent the organizational leadership perspective. There were no exclusion criteria.

## Procedures

Sites provided a list of clinicians and staff that included the names, contact information (phone number and email), and roles within the clinic. Potential participants received an email describing the EPIS framework and the study objectives to provide them with a context for the research and to focus the interviews. The email also contained instructions for scheduling their qualitative interview via an online scheduling system. Participants had the option of emailing their availability to their site’s study coordinator who would arrange their interview. After the initial email, reminders were sent every two weeks until the interview was scheduled or the baseline enrollment period (10 months, June 2017-March 2018) closed. Of the 282 implementation stakeholders invited to participate, 153 (54%) completed interviews, 56 (20%) declined to participate, and the remaining 73 (26%) were unable to be interviewed during the study window. Interviews were conducted from June 2017 to March 2018.

Upon completing their interview, participants received a link to complete their quantitative survey. Participants who completed both the interview and survey received a \$10 electronic gift card. To facilitate study participation, sites agreed to permit participants to complete study activities during their regularly scheduled work hours. Participants provided oral informed consent prior to the initiation of any study activity. A university-affiliated institutional review board approved all study procedures.

## Interviews

Independent, trained interviewers conducted one-on-one interviews via telephone using a semi-structured interview guide adapted from Aarons [39]. Interview domains were guided by the EPIS framework with an emphasis on inner context factors, including participants’ professional background and experience, site organization and structure, familiarity with EBPs in general, familiarity with the specific EBPs being implemented, and perceived factors impacting the implementation of the specific EBPs. In addition, Site PIs were asked

about organizational history with EBPs; internal (organizational) and external (community, state) leadership structures; political context (policies, funding mechanisms); and fiscal considerations. Stakeholder interviews were 39 minutes on average (*range*: 13, 85); site PI interviews were completed in two parts and required 69 minutes (*range*: 28, 153) to complete. Interviews were audio-recorded and professionally transcribed. Research staff reviewed transcripts for quality (i.e., accuracy) and confidentiality (i.e., de-identification).

Interviewer training included pre-work for priming (e.g., brief article and video on qualitative interviewing, review of EPIS study protocol), followed by a two-part live virtual training with interview skill modeling. After the initial training, interviewers conducted two mock interviews, which included a self-assessment and trainer ratings with feedback; trainer rating forms were adapted from Amico [40]. Interviewers who did not achieve adequate proficiency as determined by the trainers during the second mock interview underwent further feedback and training and completed a third. Those who failed to improve did not conduct interviews. During active data collection, trainers held monthly interview support calls focused on continued skill development and resolving issues raised by interviewers or identified through transcript review.

### Analysis Plan

Interview data were analyzed using a hybrid approach to content analysis. Content analysis involves the “subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” [41 p. 1278]. Analysis began with directed content analysis, a deductive approach that begins by developing a coding framework using existing theory or prior research on the phenomenon of interest. The initial deductive coding framework for the current study was composed of constructs and their operational definitions based on the EPIS model [19,20] and the extant EPIS literature [22,25,42–44]. After interview data were coded to the initial coding framework, interview data coded to the EPIS *Innovation* construct were examined using conventional content analysis [41], an inductive approach. *Innovation* refers to factors that relate to the EBP itself and its *fit within the implementation context* [20]. *Innovation* also included *feedback on EBP implementation procedures*. During the inductive phase, stakeholder comments were summarized to identify factors associated with intervention implementation into HIV prevention and treatment settings. Descriptions of these factors were developed and quotes were selected to illustrate the identified factors.

The coding team was led by the lead author and study co-Principal Investigator, an experienced, female qualitative researcher with a doctoral degree. Three coders, two (female) research assistants with a baccalaureate degree and one (male) post-doctoral fellow with qualitative coding experience, coded the interview data. Coders were trained in the EPIS model, the analytic approach, and coding software, NVivo Version 12 (QSR International, Inc.). Coders then collaboratively coded six interviews (3 site PI, 3 key implementers) to familiarize themselves with the data and finalize the initial codebook. An initial assessment of inter-coder reliability was conducted on two novel interviews (1 site PI, 1 key implementer), and percent agreement between coders was high at 97.45%; thus, coders were released for independent coding. Inter-coder reliability was assessed

on an ongoing basis throughout the coding process by randomly selecting 30% of the interviews for co-coding. Overall inter-coder reliability remained strong at 98.2% agreement among coders. After each reliability assessment, coders met to discuss and resolve coding discrepancies. The coding framework was iteratively updated throughout the coding process resulting in 58 constructs describing inner, outer, bridging, and innovation factors.

## RESULTS

Demographic and occupational information (Table 2) was collected via electronic survey, which 128 (83.7%) of the 153 interviewees completed; thus, this information is missing for 16.3% (25) of interviewees. Just over a third were clinical providers ( $n = 47$ , 36.7%, e.g., physicians, nurses, pharmacists, dietitians); just under a third were psychosocial providers ( $n = 38$ , 29.7%, e.g., psychologists, social workers, health educators); nearly 20% were in administrative roles ( $n = 24$ , 18.8%, e.g., medical director, quality manager, program coordinator); and about 15% were in clinical support roles ( $n = 19$ , 14.8%, e.g., outreach workers, peer advocates, medical assistant). Participants had a range of experience in their current position (7.0 years  $\pm$  6.3) and the HIV field (11.0 years  $\pm$  7.7). More were female ( $n = 104$ , 68.0%) and over three-quarters identified as Black ( $n = 52$ , 40.6%) or White ( $n = 49$ , 38.3%).

Pre-implementation interview content coded to the EPIS *Innovation* construct was summarized into four themes. Two themes highlighted critical issues for implementing MI-based EBPs into HIV prevention and treatment settings. The first was the extent to which MI *fit with the patient population*. Second was *providers' receptivity* to MI, which spotlighted perceived fit within *providers' scope of practice*, provider *buy-in*, and the amount of *time* needed to effectively implement MI. Two themes summarized stakeholders' recommendations for implementation. The third theme addressed issues related to *training and fidelity monitoring* and the fourth broader *recommended implementation strategies*.

### Fit with the Patient Population

Stakeholders identified several characteristics of their patient population that would facilitate the use of MI-based EBPs. Namely, stakeholders described an emphasis on autonomy and self-efficacy as being a good fit for their patients' ages and developmental stages.

“We’re working primarily with adolescents, so that developmental age of needing their own autonomy and really not wanting to be told what to do, but certainly important to help lead them in directions because many of them don’t and haven’t had good role models or anyone to educate or lead them. So, motivational interviewing really provides that concept of allowing patients to feel as though they’ve made their own decision. And I think it builds their self-confidence; it helps to make them feel like they’re respected by us, that we value what they think.”

[nurse practitioner]

Stakeholders familiar with MI’s evidence-base and the substance abuse treatment context in which the intervention approach evolved viewed MI-based EBPs as fitting well with their many patients who have substance abuse problems.



“A high percentage of our patients really struggle with drug and alcohol issues, and so I know that MI has been instrumental in helping patients through that process.”

[social worker 1<sup>1</sup>]

Stakeholders suggested that MI-based EBPs would help providers connect with patients who are emotionally charged (e.g., “severely distressed,” angry, upset, aggressive). They described some patients as being fearful due to past experiences of having been threatened with or experienced physical, verbal, or emotional abuse.

“We just have some kids that come in a little angry. I feel like just kind of talking to them a little bit and getting them to open up, I think they’ll be open to [motivational interviewing]. I don’t know any way that you’d get them to open up any faster than by being caring and respectful.”

[physician 1/division chief]

In contrast, some foresaw problems using MI-based EBPs with specific patients. Stakeholders viewed some patients as reluctant or resistant to engage in behavior change discussions. They further explained that a MI-based approach was unlikely to “work” with some patients, such as those with a developmental delay, incurred trauma, or arriving at their appointment “altered on drugs.” Stakeholders expressed concern about employing MI-based EBPs with difficult to engage patients and those at high risk for being lost to follow-up. Interlaced with these discussions was a concern about whether participation would require significantly more of the patient’s time, with time being a component of the provider receptivity theme described next.

“We have PrEP patients that I’d love to spend more time and really try to change some behavior, but you can’t. You can only beat them on the head so many times. You have to bide your time and figure out when it’s going to be an appropriate time. So, sometimes they’re just in and out because that what they have time for and that’s what they’re up for. And other times you have a little bit more of a golden moment and you have a little bit more opportunity to use it. So, it’s a little bit more patient responsive, of responding to the patient’s needs.”

[physician 1/division chief]

### Provider Receptivity

Providers’ receptivity involved how MI-based EBPs aligned with providers’ scope of practice, the need to establish provider buy-in, and time.

**Scope of practice.**—Providers’ perceptions of the EBPs’ alignment with providers’ scope of practice varied. Some stakeholders viewed MI and MI-framed interventions as consistent with professional best practice standards by creating safe spaces and conveying clinician patience and availability. Most providers reported striving for a client-centered model of care in their practice, characterized by a nonjudgmental approach to behavioral change in which patients are encouraged to arrive at their own decisions. These stakeholders viewed MI, and

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<sup>1</sup>Stakeholders with the same role identification are numbered in order of appearance in the manuscript

MI-based EBPs by extension, to be a useful strategy to build trust and alliance with patients. Some suggested providers might already be using MI or have elements of MI skill integrated into their existing clinical practice. These stakeholders asserted that most people who work in adolescent medicine have used MI or innately have clinical skill consistent with MI.

“I don’t think clinicians are specifically using motivational interviewing with the understanding that it is motivational interviewing. Our clinicians are great at what they do. Just understanding what motivational interviewing is and the components that it really tries to highlight and focus on are definitely things that I have seen when just observing a clinical appointment, but it never has been as specific as this clinician right now is implementing MI and are using this strategy.”

[case manager 1]

Other stakeholders were less optimistic about the integration of MI-based EBPs into clinical practice. These stakeholders were concerned that medical providers’ training might result in a perception that MI-based EBPs go “*against the medical model*” [social worker 2] or may not be “*as useful when trying to work with someone outside of case management activities*” [case manager 2]. These stakeholders questioned how a transition in clinical care practices would change the dynamic of their relationship with their established patients.

“I think the biggest barrier, outside of a time constraint, is that we have providers who have been working in this field for a very long time who kind of fall back just on how they’ve always been doing things and that might be a challenge to shake them out of that and to get them to consistently utilize this model.”

[social worker 2]

**Provider buy-in.**—Consistent with scope of practice concerns, stakeholders asserted a need for provider buy-in, characterized as providers’ commitment to and enthusiasm for learning and using the MI-based EBPs. Some stakeholders had preconceived notions or ideas that were inconsistent with the broader MI literature, which resulted in a negative attitude (e.g., *patients will not like being told what to do*). Stakeholders anticipated low provider enthusiasm due to resistance to learn new skills and their perceptions that learning new approaches would be “*too much work*” [research manager] or just “*one more thing to learn*” [quality nurse]. This skepticism was informed, in part, by prior experiences where there was a lack of enthusiasm for new practices.

“Our perinatally infected kids who we’ve known for years and years, some people have known them their whole life before now. I think it’s harder to implement a new approach without feeling disingenuous. In other words, they kind of see through it because they know you as well.”

[psychologist 1]

Some expressed concern implementing MI-based EBPs with difficult to engage patients.

“It’s not effective when we have patients who don’t want to talk. They don’t want to answer questions. They don’t want to do any of that and it happens. I’ve tried [MI] with a patient but she just won’t talk. So, I don’t think it’s effective when a patient is not even open to talking. They may need it to just be a yes or no answer.

And I know in MI, they talk about open-ended and closed-ended but I think the close-ended side is used best when you have people or individuals who don't really want to talk."

[social worker 3]

Other stakeholders recounted more favorable past experiences with implementing EBPs, but noted inconsistencies in the implementation approach. As mentioned above, training only a subset of clinic staff (e.g., social workers, case managers) introduced barriers to effective implementation.

"It can't just be social workers. It needs to be medical providers also practicing motivational interviewing. And for us to work as a team because we work so closely together and sometimes are in the same visit. And so, the language needs to be the same."

[social worker 1]

**Time.**—A primary, cross-cutting concern for many stakeholders was time – time to learn the EBPs, time to deliver them, and allowing time for them to work. The duration and intensity of the proposed training plans (e.g., multiday initial training workshops, ongoing supervision and coaching) was perceived to be too time consuming.

"It takes a lot of time to really monitor and implement evidence-based interventions, because they have some type of fidelity monitoring. And most grants don't support that time anymore at that level."

[physician 2]

Already under the pressure of high caseloads and limited appointment durations, stakeholders expressed concern that integrating the EBPs into patient interactions would require a significantly longer visit duration, a disincentive in the current reimbursement context.

"Fee for service doesn't support the time to implement evidence-based interventions. Medicare reimburses more for frequent short visits rather than longer or more intense visits. It just doesn't encourage the type of time that it takes to implement some of these behavioral [EBPs]."

[physician 2]

Finally, engaging in the patient-centered process and acknowledging patients' decision-making autonomy, a characteristic of MI-based EBPs, requires that providers encourage patients to explore their own motivations for behavior change and to arrive at their own decision about their health at their own pace. Giving patients this time can be difficult and distressing for providers.

"The benefit with MI is that we're taking a step back and letting them guide and tell us how they're feeling. They can get to the point where they feel an investment in their care and well-being and that's going to carry them through adolescence and adulthood because it's really coming internally. The difficult part is that it takes time to get there. Sometimes our providers don't feel like we have time because

the virus is so smart. When it comes to issues of adherence, if somebody's not taking their medication appropriately, then their virus is becoming resistant and blowing out classes of medication, and so there's this really difficult dance that we do against time."

[social worker 2]

### Training and Fidelity Monitoring

Concerns about time were balanced by a recognition of the need for high quality training and ongoing support for EBP integration: *"My concern as a provider who's been trained in MI is maintaining the implementation of MI in the setting because it's very easy to slip back into how you've been counseling patients, which often doesn't include MI"* [physician/medical director]. Stakeholders described a number of training considerations likely to facilitate the implementation and sustainment of the EBPs. To avoid overwhelming staff, stakeholders suggested a simple, iterative initial training plan that did not include too many training components, such as *"allowing some independence and flexibility"* [psychologist 2], and clearly communicated next steps. Stakeholders viewed broad engagement (including clinicians and non-clinician staff members) in an initial multi-day, in-person training workshop involving role plays followed by ongoing coaching with an expert to avoid falling back on "what you know" as very important. They also recommended adapting the curriculum to the setting and personalizing the training to the provider, for example, providing case illustrations highlighting patient and provider success stories in the same or other settings. They also endorsed the proposed internal training coordinator to set up meetings, monitor staff completion of required training components, and remind staff to use the EBPs.

"I really respond to the idea of having an internal facilitator, someone earmarked to say 'hey, here's what we need to keep doing and I'm in charge of setting up these meetings so that we can continue'. Because where we have had trouble, and probably everybody ever trying to implement MI, is that to really stay true to it, you have to practice and someone keeping you honest in terms of how you're using the skill."

[psychologist 1]

The need for ongoing encouragement to use and develop proficiency with the EBPs as well as ongoing fidelity monitoring were also highlighted. While stakeholders thought it was important to provide opportunities for skills maintenance, they forecasted mixed reactions to some of the proposed skill development strategies. Recommended skill development activities included self-assessments and getting feedback from experts on personal progress and areas to improve as well as the provision of real-life client examples. As mentioned earlier, stakeholders suggested demonstrations of the EBPs use with the patient population to facilitate implementation. Fostering a community of practice in which all staff are trained and implement the EBPs together was considered highly sustainable as the approach built-in ongoing support and feedback. The three quotes below illustrate this idea:

"It would be helpful to have discussions around [use of the EBP] when we are focusing on an individual patient in the monthly disciplinary meeting."

[physician's assistant]

“At our case conference, talk about how we implemented MI.”

[case manager 3]

“It has to be integrated in the meeting as part of the discussion.”

[research director]

When it comes to training and ongoing fidelity monitoring, the overall message was: *“The easier you can make it for people, the better it's going to go.”* [psychologist 2]

### Recommended Implementation Strategies

Finally, stakeholders suggested several implementation strategies to facilitate provider buy-in and overcome resistance. Stakeholders recommended that trusted members of the team (informal leaders) have a role in the implementation process. Stakeholders also suggested collaborative planning meetings to discuss patient care, treatment planning, and how to integrate the EBPs into patient care. Finally, encouraging site-wide education and implementation was viewed as a way to foster a community of support for the EBPs that would sustain the intervention post-implementation and cultivate a consistent experience for patients.

“Making sure that it's not just the same people, like the social workers or the case managers, who are really committed. Really wanting to know that there's a commitment from our medical providers to implement this and to utilize it across the board, because they'll be speaking the same MI language.”

[social worker 2]

Stakeholders felt strongly that clinicians' experience and clinical expertise should garner them autonomy over some aspects of clinical decision-making, including which patients would benefit from the EBPs. Highlighting how learning the EBPs benefit providers or make their job easier was another strategy to support implementation. To elaborate, stakeholders thought MI-based EBPs would engage patients and reduce resistance through client-centered communication as well as placing the *“accountability”* for their own health on the patients, easing the burden on providers. Learning these interventions would augment providers' skills, and offering continuing education credits was suggested. Lastly, stakeholders suggested that knowing the evidence-base that supports the EBPs and providing evidence of their efficacy would encourage buy-in and build providers' motivation for implementation.

“It's always helpful to have good data to show that it works. That's always something that's motivating.”

[physician 1/division chief]

The intensity of the training plans and perceptions that MI would take significant time to deliver contributed to a concern that MI would be difficult to integrate into clinical flow (decreasing receptivity). To mitigate this concern, stakeholders suggested offering demonstrations of how easily the interventions can be integrated into clinical care.

“Being able to show that it fits into a clinical visit and doesn’t disrupt clinical flow, which a 12-hour training doesn’t exactly make you think that. But if you can demonstrate that it’s easy to incorporate, that helps with facilitation.”

[physician 1/division chief]

A final EBP implementation strategy was leveraging the potential impact of MI on patients’ health. Stakeholders viewed MI as a strategy to address patients’ internal barriers to change that could help make them healthier and able to accomplish treatment goals, such as increasing medication adherence, appointment adherence, reducing risky sexual behaviors, and building rapport with providers. Stakeholders also remarked that clinicians using MI would be able to identify more services to support their patients’ health, including services for those who were already doing well.

“Increased show rate for appointments. I think part of what gets in the way of young people living with HIV managing their care is that they don’t always stay engaged in care. And so, if we’re using MI the right way or if we’re using it consistently, I think we might see our patients actually show up for their appointments because they’re aligning their values of staying healthy and so on with the care that they’re receiving. Down the line, a big lofty goal would be viral suppression and increasing viral suppression at a clinic level.”

[research coordinator]

## DISCUSSION

This study is among a few to use theory-driven implementation science to examine EBP implementation in HIV prevention and clinical care and to specifically focus on youth 13–24 years of age, a group at elevated risk for contracting HIV and experience poor outcomes compared to others living with HIV. Using the EPIS framework [19,20] to guide the investigation, we interviewed implementation stakeholders in *preparation* for the implementation of four MI-based interventions in 13 HIV prevention and treatment settings across the United States as part of the ATN Scale It Up (SIU) research program. Across these sites and interventions, stakeholders identified two critical factors for effective EBP implementation. The first factor, the extent to which the MI-framed EBPs *fit with the patient population*, is consistent with the EPIS framework outer context factor ‘patient/client characteristics’ [20]. How well an intervention meets the needs of the population it is targeting is, unsurprisingly, a factor identified in many HIV implementation studies [6,13,16,27,45,46], including two previous reports from the SIU research program. Stakeholders completing the survey component of this mixed methods implementation study rated EBPs, in general, as fitting well with the needs of their patients (assessed with the Fit sub-scale of the Evidence-Based Practice Attitudes Scale (EBPAS [47]),  $M_{Fit} = 3.31$  out of 4) [14]. The importance of *fit* was illustrated in comments about the interventions aligning with adolescents’ developmental need for autonomy and the perception that MI-based interventions are effective with those who abuse substances or are emotionally volatile. When asked specifically about the TMI intervention, some patient characteristics (age, cognitive state, housing security) were viewed as an implementation barrier [15]. Attention

to fit is critical as a mismatch between an intervention and the patients it is intended to serve can result in adaptations to the intervention that diminish intervention fidelity [16].

The second critical implementation factor was *providers' receptivity* to EBPs with three facets, alignment with *providers' scope of practice*, provider *buy-in*, and the amount of *time* needed for effective implementation, highlighted by stakeholders. In the EPIS framework, characteristics of the individuals tasked with implementation is a component of the inner context as they directly influence the implementation process [20]. Data from the survey component of this study indicated stakeholders' viewed EBPs as aligning well with their scope of practice and having intuitive 'appeal' ( $M_{appeal} = 3.24$ ) [14]. Interview data, however, suggested a more mixed perspective. Some identified the client-centeredness and adoption of a nonjudgmental attitude as well aligned; others highlighted tensions with implementing MI-framed interventions in a medical context. Zhang and colleagues [6] found PrEP prescribing practices varied based on provider type, revealing an implementation barrier related to providers' perceived scope of practice.

When implementing an EBP in a clinical setting, provider buy-in is essential and has been highlighted in several HIV implementation studies. To illustrate, despite appreciating the support and accessibility of the CARE+ eHealth intervention, providers devalued the intervention over their own care provision, viewing the intervention as unable to replicate the quality and sensitivity provided by a health care provider [48]. High levels of staff engagement, an indicator of provider buy-in, was a critical implementation facilitator in the implementation of Positive Health Check [16]. Also, provider perceptions of the drug's efficacy and safety has influenced PrEP implementation [6]. In the current study, stakeholders' buy-in was tempered by limited enthusiasm for learning the EBPs, concerns about patient receptivity to the interventions, and uniformity of implementation. Survey results were consistent with this finding, describing low levels of enthusiasm about trying new interventions ( $M_{openness} = 1.90$ ).

In their interviews, stakeholders expressed reluctance related to the amount of *time* that would be needed to learn, deliver, and see the results of the interventions realized. These concerns were reflected in the low rating of the EBPAS 'Burden' sub-scale ( $M_{burden} = 0.65$ ), which assesses time and administrative demands of EBPs [14]. When considering TMI specifically, time limitations of clinical encounters was an implementation concern [15]. Time is a universal concern when integrating new practices into already strained HIV service delivery systems. Time to learn and deliver the intervention was a critical factor in the implementation of Positive Health Check, a digital counseling intervention [16], and a component of 'workload management' [6] and 'resource' [13] concerns expressed in two PrEP implementation studies. In addition to identifying barriers, providers are also a source of critical knowledge to facilitate the implementation process starting with strategies to facilitate training.

Recommendations for structuring *training and fidelity monitoring* activities acknowledged the need for rigorous fidelity monitoring and offered strategies to facilitate provider buy-in and overcome resistance, such as clinic-wide participation and ongoing coaching. The survey results again echoed the sentiments expressed in the qualitative data.

Stakeholders' expressed supportive attitudes about receiving feedback on their performance delivering EBPs ( $M_{feedback} = 2.93$ ), but found 'educational support,' assessed using the Implementation Climate Scale [49], somewhat lacking ( $M_{educational\ support} = 2.00$ ) [14]. Many of the *recommended implementation strategies* were among the implementation strategies identified by the Expert Recommendations for Implementing Change (ERIC) study [50]. For example, 'organize clinician implementation team meetings' is akin to collaborative discussions of EBP implementation and 'make training dynamic' encompasses offering demonstrations, tailoring the training to the implementation context, and ongoing coaching. Stakeholder feedback will be used to tailor the implementation strategy to the unique needs of HIV prevention and treatment settings.

Effective implementation of EBPs into HIV care settings requires a strategic approach that addresses the concerns of the stakeholders tasked with EBP integration. Thinking about implementation as an organizational and provider *intervention* offers a familiar framework for developing an implementation strategy. Just as the first encounter with a new patient is dedicated to building rapport and developing a treatment plan, investing effort in assessing and enhancing provider receptivity to the EBP while preparing for its implementation is likely to increase its success [50]. Providers are more likely to invest their energy in learning and delivering an EBP they are convinced will address their patients' needs. Taking the time to share the evidence base when introducing a new EBP and developing clinically relevant examples, such as patient testimonials or brief videos demonstrating EBP use in the providers' specific settings and with their typical patients were two strategies proposed to increase EBP acceptability, particularly when providers are reluctant. Zulkiewicz et al. [16] illustrated the importance of engaging those responsible for EBP delivery in the planning stage for generating buy-in among primary care HIV clinics. In clinics where implementation staff were able to meet with providers and demonstrate the EBP, implementation was facilitated. In other clinics where clinic staff were not engaged or did not arrive at a consensus regarding EBP implementation, implementation was ineffective.

Just as collaborative treatment planning in HIV treatment is associated with better outcomes [51], collaborating with the providers who will be responsible for delivering the EBP is a critical implementation strategy [50]. Collaborative implementation planning enables the identification of concerns and perceptions about the EBP that can be addressed prior to or during implementation. To illustrate, a prominent theme in this study was a concern that MI-framed interventions require providers to spend more time with the patient. Understanding this concern, initial implementation activities might be tailored to provide evidence illustrating that MI-based interventions do not increase the duration of patient encounters. For example, providers might be surprised to learn that using MI did not increase time spent discussing HPV vaccination among vaccine-hesitant patients [52] or that MI encounters as brief as fifteen minutes are effective, especially when patients experience multiple encounters over time [53], a characteristic feature of HIV care. Another belief was the potential iatrogenic effect of implementing MI-based interventions with patients who were "difficult to engage," are at high risk for being lost to follow-up, or with certain conditions, such as developmental delay or incurred trauma. Highlighting the features of MI-based interventions – client-centeredness, support for autonomy and self-efficacy – that make them an excellent approach to behavior change with such populations [54–56] and



reduce patient resistance [57] may alleviate such concerns. Physicians who doubt their own ability to deliver MI-based interventions might be assuaged by the fact that physicians have been shown to be as effective as psychologists in delivering MI [53], and that patients respond more favorably to MI as compared to traditional medical advice-giving [57]. These views underscore the need to engage with stakeholders, understand and address their concerns, and illustrate EBP utility with diverse members of the targeted population. Further, the assessment of stakeholders' attitudes toward an EBP is highlighted as a critical step toward effective implementation in the EPIS literature [47,58] and is recommended as a consideration in designing implementation strategies [50]. Failure to take this critical step during the preparation stage may undermine the implementation effort if providers make preemptory decisions about with whom and when to use an EBP.

Finally, in most cases, the execution of a treatment plan is entrusted to the patient and their support system. Likewise, in the implementation of an EBP, trusted members of the organization who understand the culture of the setting and the dynamics of the treatment provider team are typically responsible for EBP implementation. A key implementation strategy to leverage this organizational resource is developing an implementation team [50]. Scale It Up's TMI project [30] leveraged this implementation strategy and established implementation teams, or iTeams. Each site nominated EBP champions (dedicated advocates for EBP implementation [50]), local opinion leaders (staff members "educationally influential" about the EBP [50]), and other critical organizational members to serve as iTeam members. The goal of the iTeam was to leverage key stakeholders within the site who were familiar with the EBP, understood the value of the EBP, its fit with the patient population's needs, and/or its alignment with best practices and, thus, were uniquely positioned to facilitate the integration and adaptation of the MI-based interventions into their sites. The iTeam was also a capacity-building strategy for EBP sustainment beyond the implementation period. By cultivating an iTeam and, through the iTeam, a community of practice that engages all members of the clinical team, the likelihood of the EBP being sustained beyond the implementation intervention is increased [59].

Beyond the iTeam, stakeholders recognized that effective EBP implementation requires effective initial training and ongoing fidelity monitoring and feedback. Organizations often experiment with an intervention prior to a dedicated implementation effort [19] suggesting that providers may already be using some aspects of an EBP in their current clinical practice. Formal (organizational leadership) and informal leaders (iTeams, communities of practice) may find helping providers to realize the EBP is not necessarily an entirely new approach or aligning the EBP with providers' existing approaches to be an effective implementation strategy. Ongoing monitoring of EBP fidelity also presents an opportunity to highlight increases in providers' proficiency and their successes with the EBP, much like reviewing laboratory test results provides the opportunity to link changes in health to changes in patient behavior. The advent of artificial intelligence techniques, machine learning specifically, has greatly increased the feasibility of timely treatment fidelity assessment, particularly for MI and MI-based interventions [60]. To illustrate, Adkins, Narayanan, and Imel, founders of Lyssn ([www.lyssn.io](http://www.lyssn.io)), have developed machine learning-based tools to deliver MI fidelity feedback [61] to providers to support skill development and treatment fidelity based on the Motivational Interviewing Skill Code [62]. With Lyssn, providers can

receive feedback on their clinical skill within minutes of upload a recording of a client interaction or engaging with the Lyssn software.

This study is limited to the 13 participating HIV prevention and treatment settings, all of which were located in urban areas, affiliated with academic institutions, and providing multidisciplinary adolescent HIV care. Additional research is needed to understand the issues associated with EBP implementation in other HIV care settings. The current study was conducted prior to EBP implementation and, thus, the stakeholder perspectives are based on their existing knowledge of the EBPs, their organizational context, and the description of the EBP and implementation activities provided during these interviews. Reassessing stakeholders' views post-implementation would provide insight into the factors impacting MI implementation experienced during EBP implementation that may inform the supports necessary for effective implementation and sustainment of the EBPs. Post-implementation assessment of critical implementation factors would also allow for the assessment of which factors serve as determinants (i.e., predictors) and mechanisms (e.g., mediators or moderators) of EBP implementation. Next steps for this research include assessing stakeholders' perspectives post-implementation and examining sites with high and low implementation fidelity to understand the degree to which fidelity serves as a moderator of EBP outcomes. Future research might also examine perceptions of different stakeholder groups or by stakeholder role in the implementation process to better understand the variation in awareness and impact of stakeholders' attitudes and beliefs on EBP implementation.

## Conclusion

The implementation of EBPs in HIV prevention and care settings is a critical step toward achieving UNAIDS's 95-95-95 Initiative [63] and *Ending the HIV Epidemic* [3]. While many evidence-based HIV-related behavioral interventions, including MI, have demonstrated success in the academic setting and have been widely disseminated through the US Centers for Disease Control and Prevention ([www.cdc.gov/hiv](http://www.cdc.gov/hiv)), there are many challenges to the successful implementation and sustainment of EBPs in real-world settings [9]. The field of implementation science in HIV is rapidly developing and this study is the first to use implementation science to study EBP implementation in adolescent HIV settings. The findings reported here suggest a strategic approach to EBP implementation that begins with rapport building, collaboratively developing the implementation plan, and entrusting internal stakeholders with the responsibility to execute the implementation plan. The information gathered in this study will be used to improve the implementation plans for the four EBPs to be implemented across 13 youth-serving HIV prevention and treatment sites [38]. Sharing information related to anticipated barriers and facilitators as well as stakeholder-recommended implementation strategies via an iTeam is one example [30]. While this study examined the implementation of MI-based EBPs, which may not be generalizable to other EBPs, engaging stakeholders in pre-implementation planning is a worthwhile upfront investment of time and resources to understand the implementation context, identify provider concerns, and solicit strategies to address those concerns, as it paves the way for successful implementation.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1:**

## ATN Sites

Site	City	Name	Scale It Up Program Participation			
			TMI	SMART	YMHP	We Test
1	Baltimore	Johns Hopkins University				
2	Birmingham	The University of Alabama at Birmingham Birmingham AIDS Outreach				
3	Brooklyn	State University of New York Downstate Medical Center				
4	Detroit	Wayne State University				
5	Los Angeles	Children's Hospital of Los Angeles				
6	Memphis	St. Jude Children's Research Hospital				
7	Miami	University of Miami				
8	New Orleans	Tulane University School of Medicine				
9	Philadelphia	Children's Hospital of Philadelphia				
10	San Diego	University of California - San Diego				
11	Tampa	University of South Florida				
12	Washington, D.C.	Children's National Medical Center				

ATN = Adolescent Medicine Trials Network for HIV/AIDS Interventions

TMI = Tailored Motivational Interviewing

SMART = Sequential Multiple Assignment Randomized Trial

YMHP = Young Men's Health Project

**Table 2:**

## Stakeholders' Demographic Characteristics (N = 153)

Variables	n or <i>M</i>	% or <i>SD</i>
Unknown demographics	25	16.3%
Gender		
Female	104	81.3%
Male	20	15.6%
Transgender/ Genderqueer	4	3.1%
Race/Ethnicity		
Black	52	40.6%
White	49	38.3%
Other: Latino, Asian, Multi-racial	27	21.1%
Age, in Years	40.9	11.2
Highest Degree		
HS Diploma GED/ Associate Degree	23	18.0%
4-year Degree	28	21.9%
Masters/Doctorate Degree	77	60.2%
Clinical Role		
Clinical Provider	47	36.7%
Psychosocial Provider	38	29.7%
Clinical Support	19	14.8%
Administrative	24	18.8%
Current Career Level		
Entry Level (<2yrs)	10	7.8%
Professional Level (2yrs plus)	86	67.2%
Management	16	12.5%
Senior Management or Director	13	10.2%
Other	3	2.3%
Years in Position	7.0	6.3
Years in HIV Care	11.0	7.7