Understanding Clinician Perspectives and Recommendations of The SUPPER Project's (Substance Use Prevention Promoted by Eating family meals Regularly) Implementation in Clinical Settings: A Qualitative Analysis

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Abstract

This research investigates the implementation of The SUPPER Project, a family-based substance use prevention program for parents/guardians of 5th-7th graders. The study seeks to inform The SUPPER Project's future direction and assess its feasibility in clinical settings. Preventing substance use at a young age is vital to establish healthy behaviors and reduce the risk of substance use disorders. This research study collected data through semi-structured qualitative interviews with 10 healthcare providers providing care to adolescents in the Greater Boston area. Interview questions were developed based on the public health RE-AIM framework to inquire about program feasibility. The findings suggest that provider concerns about adolescent substance use vary, with positive parent-child communication being key to prevention. Parental education and support are necessary to facilitate these conversations. Barriers to adoption of The SUPPER Project into clinical settings include healthcare provider and clinical challenges related to time constraints, resource shortages, and potential knowledge gaps. Recommendations include prioritizing clinics with a perceived need, obtaining buy-in at the clinic leadership level, creating visual recruitment mechanisms, and adapting interventionist visits to reduce provider involvement. Offering multilingual materials and translation services is crucial, as is exploring implementation in schools and community organizations. This research provides insights to enhance substance use prevention efforts in adolescents and improve parent-child communication, addressing a significant public health issue.

Project Summary

This APE+ILE project concentrates on the overarching public health issue of substance use prevention in adolescents, specifically during the 5th-7th grade age as defined by The SUPPER Project.[1] The SUPPER Project is a large-scale randomized control trial that is looking at a brief communication-based intervention aimed at preventing substance use among adolescents by improving parent-child communication. The purpose of this APE+ILE project is to

qualitatively assess clinician perspectives, recommendations, and challenges for the effectiveness and feasibility of implementing The SUPPER Project within the clinical environment, preferably within pediatric or family medicine clinics.

The overall goal of this APE+ILE project is to inform The SUPPER Project's direction for future implementation and assess and report The SUPPER Project's feasibility in implementation in clinical settings. If addressed, this APE+ILE project will inform the future direction of The SUPPER Project's dissemination into the clinical environment, which will provide children and their parents seeking clinical care resources which will aim to improve parent-child communication about substance use and aid in substance use prevention for adolescents. Preventing substance use at an early, yet volatile and adaptable age, can help children develop healthy behaviors and avoid developing substance use disorders later in life.

Introduction

Background

Substance use disorder (SUD) prevention in adolescents is an important avenue of addressing the public health issue of SUD as it is known that the risk of developing SUD greatly increases during volatile times of transition,[2] such as starting middle/high school or college, and adolescents are particularly vulnerable to developing SUD due to the effect of substances on their still-developing brains and bodies.[2] As such, primary and secondary prevention efforts which prevent the onset of SUD, detect the early stages of SUD and associated behavioral changes, and apply interventions before the beginning of clinical SUD in adolescents are of utmost importance to addressing this public health issue very early on in its course of development.[2]

Some examples of common primary interventions for adolescents include community and family programs, family education programs, and high-quality anti-substance programs in schools,[4] while secondary interventions can involve SBIRT (screening, brief intervention, referral to treatment) screening methods in clinical pediatric settings.[3] Some examples of screeners

include the BSTAD, CRAFFT, and AUDIT screeners,[9] but some evidence has suggested that the proportion of physicians who fully screen and advise adolescents on substance use and consumption during routine visits is quite low nationally.[10]

The SUPPER (Substance Use Prevention Promoted by Eating family meals Regularly)[1] Project developed by Dr. Margie Skeer at Tufts University School of Medicine is one such example of a family-based intervention that involves conversation prompts regarding substances and substance use initiation for parents to discuss with their children over the setting of family meals, as well as informational content and text reminders.[1] The SUPPER Project was developed to be available to schools and the pilot phase has shown positive results in engaging parents to have deeper conversations with their 5th-7th grade age children with the aim of delaying or preventing the initiation of substance use, but the research team has further expressed interest in determining the feasibility of implementation in clinical settings.

It is important to distinguish The SUPPER Project as a prevention program rather than as a screening, brief intervention, or treatment program as the contents of The SUPPER Project are intended for all adolescents regardless of their health and wellness. The SUPPER Project currently consists of three parts: delivery of a handbook and referral packet with helpful conversation prompts for parents with resources on health and substance-related services, weekly text messages sent to the parent for approximately 3 months regarding substance use prevention, and two 1-on-1 sessions with an interventionist who helps the parents become more comfortable with talking to their children about sensitive topics regarding substance use.[1]

In background, The SUPPER Project is one currently ongoing research project in The Skeer Lab at Tufts University School of Medicine. The mission of The Skeer Lab is “developing and implementing innovative substance use interventions to prevent risk, improve health & behavioral outcomes, and reduce disparities.”[13] Other currently ongoing projects at The Skeer Lab similarly involve analyzing providers’ perspectives on opioid prescriptions, local perspectives on cannabis legalization, prevention of teenager crystal meth use, and more,[14] with primary

funding sources being grants from the National Institute of Health and the National Institute on Drug Abuse.[1] In particular, the goal of The SUPPER Project is to improve communication between parents and children by engaging deeper conversations about sensitive topics like substance use to aid in decreasing the risk factors associated with substance use initiation in childhood.[13]

Previous research has shown that delaying the initiation of substance use in adolescents can decrease their risk for developing SUD later in their lives.[4] Relatedly, increased quality of parent-teen communications has shown to have a protective influence on the initiation of teenage substance use,[5] and that adolescents which expressed difficulties or barriers to talking to their parents about substances and substance use issues have higher risks for developing SUD later in life.[6] Thus, The SUPPER Project intends to address the substance use prevention effort at the level of parent and child communication. The SUPPER Project is one potential preventative intervention which can be a promising tool to implement or recommend in school and potentially clinical settings in the future, as it is intended to be given to all adolescents before substance use and substance use-related issues begin.

ALE Project Objectives and Products

The intention of my APE+ILE project is to interview pediatric/adolescent healthcare providers in Greater Boston to assess if the clinical environment is a feasible setting to implement and recommend The SUPPER Project to parents and their children. Analyzing the implementation efficacy and reasonability of The SUPPER Project in clinical settings is, in the short term, important to consider in potentially expanding the intervention to address this prominent public health issue in clinical settings. In the long term, this project's informing The SUPPER Project can expand substance use prevention efforts in our community and state-wide and provide many children and their families resources to prevent adolescent substance use at a relatively accessible location like the doctor's office.

Specifically, the objectives of this APE+ILE project are to interview a selection of pediatric/adolescent healthcare providers within the Greater Boston area, including but not limited to physicians, advanced practice providers, clinical social workers, and clinical psychologists to determine what barriers, limitations, and recommendations healthcare providers might have to the program's implementation. The key informant interviews conducted will be semi-structured with open-ended questions about The SUPPER Project but will also include overarching discussion about current and previous prevention program practices in clinical settings to gain knowledge about the current steps needed to be taken to effectively implement The SUPPER Project. The results of these interviews, including recommendations, will be reported to the project preceptor to assist in the objective of helping mold the scope of The SUPPER Project in future implementation endeavors per the public health RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, Maintenance).[11]

Work Products

Two APE work products will be produced as a result of this APE+ILE project in addition to this ILE report. The first APE work product will be a semi-structured clinician interview guide which will contain questions to foster a discussion with clinician interviewees about the feasibility of implementing The SUPPER Project into clinical practice per the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, Maintenance)[11] (Appendix B). The second APE work product will be a codebook created as part of the qualitative data analysis output based off key themes collected from the transcribed interviews (Appendix E), along with a set of recommendations from the collected responses. The specific foundational and concentration-specific competencies assessed as part of this project are described further in Appendix F.

Incorporation of the RE-AIM Framework

To evaluate the application of The SUPPER Project in clinical settings, the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework,[11] was used to

create the semi-structured interview guide (Appendix B) for the healthcare provider key informant interviews. These five dimensions are intended to assess the overall impact of a public health intervention. The RE-AIM Qualitative Evaluation for Systemic Translation (RE-AIM QuEST)[12] framework is an expanded, mixed-method version of RE-AIM which also incorporates open-ended questions under each dimension of the RE-AIM framework to assess barriers specific to implementation. Thus, the RE-AIM QuEST framework was used to create a series of open-ended interview questions which focused on five key areas: healthcare providers' perceptions on adolescent substance misuse concerns regarding parents and healthcare providers (Reach), how effective they feel parent-involved interventions are (Effectiveness), how well equipped they feel to adopt the intervention in their clinical setting (Adoption), the logistics of implementing an intervention like The SUPPER Project in the clinical setting (Implementation), and their opinions on delivering the intervention consistently in the future (Maintenance).

Methods

The method of data collection for the APE+ILE project involves primary data collection through recorded key informant interviews as well as secondary data collection through a brief background literature review conducted using publicly accessible databases Google Scholar and PubMed. This APE+ILE project was added as an amendment to the original RE-AIM based post-implementation study for The SUPPER Project protocol and approved by the Tufts SBER IRB as remaining exempt on August 28, 2023.

Interview Guide, Email Script, and Questionnaire

The method of data collection began with a review of current interview guides, consents, and interview objectives currently in place within The SUPPER Project. Afterwards, a semi-structured interview guide was developed and finalized using the RE-AIM QuEST framework specifically to assess the impact of the intervention in clinical settings (Appendix B). A

recruitment email script and brief 10-question REDCap survey to assess background demographics and clinical work experience of the participants was also created (Appendix C, D).

Recruitment

After Tufts SBER IRB approval of the modification to the current protocol, recruitment for the interviews took place by emailing (via Tufts-affiliated email) providers in the Boston area affiliated with Tufts University, other hospitals, primary care and pediatrics offices, community health centers, and school-based health centers using publicly available data. Tufts University Faculty Directory, professional connections, and recommendations from advisors/preceptors including Tufts Career Services were also reached out to until at least 10 interviews were scheduled.

Potential interviewees were emailed purposively with the focus being on licensed clinical providers (MD/DO, PA, NP, APRN, etc.) and clinical psychologists and/or clinical social workers in Boston who provide(d) direct care to adolescent patients. Upon initial email response, I coordinated with interested participants to schedule a 30-minute Zoom interview in the upcoming weeks/month depending on their availability. A third reminder email with the Zoom link and brief REDCap questionnaire was scheduled simultaneously to be sent one day before the scheduled interview for the participant to complete.

Eligibility and Inclusion Criteria

The preferred number of participants in the sample group is at least 10. Healthcare providers were enrolled in the study sample using convenience, purposive, and snowball sampling. The inclusion criteria are:

1. Must be a provider of healthcare services (physician and/or advanced practice provider, advanced practice registered nurse, clinical psychologist, or licensed clinical social worker, etc.)

2. Must agree to participate after being contacted by the recruitment email
3. Must currently or previously provide(d) clinical care to adolescent patients in the Greater Boston area
4. Must agree to be audio recorded

Survey and Interview

A brief REDCap survey on background and sociodemographic information was sent prior to the interview via email. Healthcare providers were asked to participate in a 25–30-minute interview for the research team to gain a better understanding of the implementation and maintenance of The SUPPER Project within clinical settings. The informed consent document was available to review by the participant embedded within the REDCap survey. The qualitative interviews took place via a Voice over Internet Protocol (VoIP) through Zoom (pre-approved for general use).

Scheduled interviews were conducted over Zoom teleconferencing platform and recorded to the Cloud, at which point they were automatically transcribed using Zoom's transcription software. Participant confidentiality was retained throughout the course of the project and informed consent was verbally obtained from each participant before the interview. Interviews were digitally audio and, if consented, video recorded and transcribed verbatim via the embedded feature available within Zoom for all recorded calls. I reviewed the transcript from each interview to ensure that the transcript is accurate and includes no identifying information and made edits when necessary. After reviewing the transcripts, all recordings were deleted. I then uploaded the transcripts to a secure SUPPER Project Box folder for review by the project manager and/or preceptor.

Data Analysis

Transcripts were analyzed using NVivo 12 (Ver. 12.7.0). All edited and de-identified participant transcripts were imported into NVivo and coded using an inductive approach and a

reflexive thematic analysis technique. All transcripts were first read entirely for familiarization, and then coded inductively. Then, codes were reviewed by the preceptor and edited where appropriate. Codes were then analyzed and interpreted as a whole to form themes and recommendations. Finally, the reviewed analysis was compiled together to create a full analysis of the prevention program using the RE-AIM framework. Additionally, de-identified survey data was downloaded from REDCap and descriptive statistics on all variables were run using quantitative analysis software StataSE (Ver. 17.0.119).

Themes which appeared across all the interviews were carefully identified, analyzed, mapped together, and compared to findings of similar adolescent substance use prevention efforts as shown through literature reviews. A set of recommendations was created based off the collected results of this research and included at the end of this ILE paper. Finally, all the collected information and results of the brief literature review are reflected in this structured research report which was discussed with my preceptor and their team to inform the project's future implementation into clinical settings.

Human Subject Protection Plan

I was successfully added to the existing project's "RE-AIM based post-implementation study for The SUPPER Project" study team (IRB ID: MOD-04-STUDY-00002744) on June 22, 2023 and determined exempt by Tufts University SBER IRB. All study materials (informed consent, interview guide, recruitment email) were approved as a modification to the existing project on August 28, 2023 by Tufts University SBER IRB.

An informed consent document was provided to each participant to review before the interview and verbal consent was obtained from the participants during the interview. The consent form describes all study procedures, confidentiality and privacy procedures, potential risks/discomforts, benefits of participating, and information of who the participant can contact with questions. It includes information about the participant's right to withdraw from the study without penalty and their right to refuse to answer any question. After the interview, video and

audio recordings were deleted after the transcript was finished being reviewed for accuracy and any/all identifiable information was deleted. The REDCap survey includes no identifiable or protected health information questions. All transcripts are stored in a secure Tufts Box folder accessible only to The SUPPER Project team and all survey responses are stored securely within REDCap.

Results

In successfully executing the APE+ILE project, I systematically addressed its defined objectives. The primary goal was to conduct in-depth interviews with various pediatric/adolescent healthcare providers in the Greater Boston area, such as physicians, advanced practice providers, clinical social workers, and clinical psychologists. Through these 10 interviews, I navigated open-ended questions that delved into the barriers, limitations, and recommendations these healthcare professionals might have regarding the implementation of The SUPPER Project. Moreover, I ensured that the interviews extended beyond the specifics of The SUPPER Project, encompassing a comprehensive exploration of current and past prevention program practices in clinical settings. This approach provided valuable insights into the necessary steps for an effective implementation of The SUPPER Project. Subsequently, the results of these interviews, including insightful recommendations, were documented and presented to the project preceptor. This thorough reporting demonstrated my ability to meet the objectives of the study but also showcased a proficiency in employing the public health RE-AIM framework, specifically addressing Reach, Effectiveness, Adoption, Implementation, and Maintenance. Overall, my execution of the project exemplifies a comprehensive understanding of the subject matter and a capacity to apply acquired competencies in a practical setting.

Table 1 demonstrates the demographics of the participants interviewed for this study. While multiple categories not depicted were included in the questionnaire (Appendix C), only categories which received at least one response were included in Table 1.

Table 1. Demographic characteristics of key informants.

Key Informants	Total
Physician (MD/DO)	**5**
Physician Assistant (PA)	**3**
Nurse Practitioner (NP)	**1**
Clinical Psychologist (PsyD/PhD)	**1**
Age (Year) mean, (SD), Min-Max	**38.167 (8.183) 29-50**
Gender, *n*	
Male	**2**
Female	**8**
Race/ethnicity, *n*	
White	**8**
Multiracial	**1**
Other	**1**
Hispanic, Spanish or Latino Origin, *n*	
Yes	**1**
No	**9**
Years Practicing as a Clinical Provider, *n*	
< 3 years	**1**
3-10 years	**2**
10-15 years	**1**
15-20 years	**1**
20+ years	**4**
Other[1]	**1**
Primary Work Facility, *n*	
Hospital	**1**
Outpatient clinic	**8**
Other[1]	**1**
Approximate Number of Adolescent Patients (18 or younger) Seen Daily, *n*	
< 5	**3**
5-10	**3**
11-15	**1**
Does not see patients currently	**1**
Other[1]	**2**
Approximate Length of Time Spent with Each Adolescent Per Visit, *n*	
15-30 minutes	**3**
30-45 minutes	**3**
45-60 minutes	**1**
Other[1]	**3**

[1] Referring to a survey response received which did not indicate specific years practicing, primary work facility, number of patients seen, or length of time spent with a patient.

Themes

The key informant interviews with the healthcare providers evoked several themes across the five dimensions of the RE-AIM framework. Figure 1 showcases a thematic map which demonstrates the themes in relation to each other, and Table 2 summarizes key theme findings.

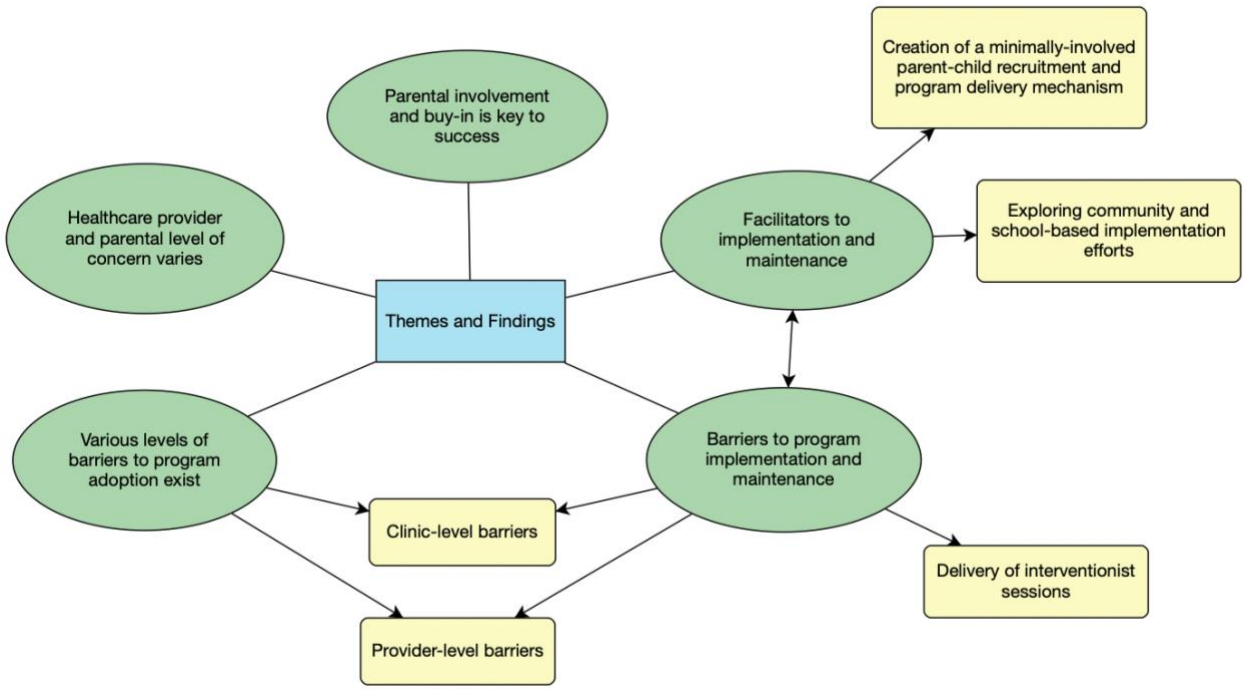

Figure 1. Thematic map demonstrating high-level themes.

Table 2. Summary of key theme findings.

RE-AIM Framework Level	Theme/Sub-Theme	Key Findings
Reach: *What is the perceived reach of the prevention program to the target audience in the clinical setting?*	Healthcare provider and parental level of concern varies	• Providers find that parents are sometimes concerned about adolescent substance use in 5th-to-7th grade children during their clinical appointments • Providers report being concerned on varying levels, from not concerned to severely concerned about adolescent substance use within their patient demographics

Effectiveness: *How effective do the providers feel the parent-involved intervention is?*	Parental involvement and buy-in is key to success	• Providers agree that parent-child communication and positive engagement are facets to preventing and/or delaying adolescent substance use • Providers report that parents may need support, education, and training to have preventative conversations with their children • The parent-child interpersonal relationship is a consideration for if a family-based intervention will be effective
Adoption: *How well-equipped do the providers feel to adopt the intervention into practice?*	Various levels of barriers to program adoption exist • Provider-level barriers • Clinic-level barriers	• Providers report that parents may find adolescent substance use discourse does not apply to their child and that parental substance use or home-life can contribute to hesitancy in program participation • Providers report that children may feel uncomfortable engaging in substance use discourse – particularly if parents are in the exam room with the child • Providers report that home-life factors such as infrequency of family meals might compromise program adoption • Communication barriers with the families can inhibit successful program adoption if program materials aren't translated or a translator isn't available for interventionist visits • A knowledge gap of substance use-related subjects may be a hindrance to providers adopting a substance use-related prevention program • Providers report not having enough time during a clinical visit to discuss substance use prevention adequately with the family • Providers report that everybody in the clinical setting is busy, juggling multiple competing interests, and have a severe magnitude of other tasks contributing to a perceived feeling of being overwhelmed • Some providers report they do not have enough supplementary material, immaterial and material resources,

		staffing, or space to adopt a new program
Implementation & Maintenance: *What are the logistics of implementing this intervention in the clinical setting, and what are the providers' perspectives on delivering the intervention consistently in the future?*	Facilitators to implementation and maintenance • Creation of a minimally involved parent-child recruitment and program delivery mechanism • Exploring community and school-based implementation efforts	• Minimizing provider involvement is a facilitating factor to program success due to previously mentioned barriers • Providers suggest recruitment of families to participate in the program can occur through mediums like posters in the waiting room, clinic, or exam room, pamphlets, scannable QR codes, or presence of a research assistant • Community based organization (CBO) and school-based settings can be a valuable avenue to explore for program implementation due to the infrequency of annual wellness/well-child visits
	Barriers to implementation and maintenance • Delivery of interventionist sessions	• Providers report that the interventionist position should be sourced from outside the clinic due to concurrent staffing concerns • Providers recommend that interventionist sessions should be completed outside of the clinic/clinical appointment time due to timing concerns • Providers recommend multiple interventionist modifications, including breaking up interventionist sessions down to 15 minutes each, conducting them virtually, or through an EMR or virtual system • A main implementation deterrent is if the clinic feels ill-equipped to handle another responsibility under their existing infrastructure

Reach Theme 1: Healthcare provider and parental level of concern varies.

Providers described the level of concern that parents have regarding adolescent substance use for 5th to 7th grade aged children through their clinical experience. Overall, most providers state that parents generally do not harbor a high level of concern within that age group of children. Some providers claim that this may stem from parents being unaware of how

substance use has the potential to start very early in childhood, leading to a low level of concern.

> I don’t think it's a big concern for fifth to seventh grade parents, I don't think they realize how early it starts and how concerning it is. So I think they’re still a little bit uh unaware or naive about the severity of the problem and how soon it is that they have to be concerned about it.
> (Unknown age male, physician of 20+ years, primary work in outpatient clinic)

> Oftentimes they'll bring it up kind of in passing, not like uh want to sit down, have a, you know, lengthy conversation about it. It's just, you know, they'll make a sly comment ‘I hope they're not doing this,’ or ‘they better not be doing that’ as opposed to asking questions about it, how to address it.
> (44 year-old female, physician assistant of 20+ years, primary work in outpatient clinic)

Some providers reported that parents of the children they see in their clinics do mention or think about adolescent substance use significantly from their experience, with particular emphasis on parents of older children and teenagers.

> I think that they're thinking about it a lot, because they can see kind of where the world is right now, and how easy or more easy access is now than ever before. And I think that that is the time when they're trying to decide how to discuss it with them. I think that it's a very important age. I mean, middle school is an important age for a lot of things, but especially for substance use. I think it's very important. They're thinking about it.
> (31 year-old female, nurse practitioner of 3-10 years, primary work in outpatient clinic)

> I think it is, probably a large concern for some of the older kids’ parents. I think it is a very significant concern when kids are in high school. I don't see a lot of people who are younger than like, I don't see kids, really, who aren't high school anymore for the most part. So I don't have a great read on how concerned their parents are. I think, in general, parents think it starts much later than it actually does. So I think middle school parents are probably less concerned than high school parents.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

Providers reported on their personal level of concern regarding adolescent substance use for 5th to 7th grade aged children through their clinical experience. All providers generally agree that substance use is either a significant or major concern for them as clinicians treating pediatric and adolescent patients. One provider also acknowledged they have pediatrician colleagues within a more affluent practice area of Boston who are not concerned about adolescent substance use and thus do not address it during their clinical visits. Other providers

report that substance use is something they are required to address during their visits, but their visit does not extend to prevention measures beyond taking the patient's psychosocial history.

> It's front and center for me because I'm an adolescent specialist, and I actually have a long history of doing substance use treatment care… I've seen practices, and including one of my friends, it's in a general peds practice, she's in private practice in a very affluent area and she's like, 'oh yeah, we don't have to talk about that with their patients, like it's not happening.' And I'm like oh, okay, like, you know, it's just like, 'well, our patients don't do that.' I'm like, yeah, they do! [laughs] Like, yeah, they do. You just didn't ask, you know.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> It is the bread and butter of we talk about a lot of the time [laughs]. You know, we're talking about mental health, we're talking about, you know, sexual health, things like that, but then it always comes back also to substance use. So I would say, I deal with it daily. There are, you know, limited things available for teenagers, I would say. But it's something that we talk about every day without fail.
> (31 year-old female, nurse practitioner of 3-10 years, primary work in outpatient clinic)

> …but you know, starting around age 11-ish, I start having conversations about this stuff with them. I guess that's, you know, parallel to around sixth grade. So yeah, I mean. It's a concern. It's just part of the overall psychosocial history. And there are a lot of things that are concerns. And this is one of them. You know, sexual health is also something. You know. You want to get a hand, know what's going on. And there are potential risks, violence, mental health. I mean, there are all kinds of things that are concerns.
> (Unknown age female, physician of 20+ years, primary work in outpatient clinic)

Effectiveness Theme 2: Parental involvement and buy-in is key to success.

Providers reported on their perceptions of parental monitoring and communication on substance use prevention and/or delaying of substance use within children in the target age group, which is the premise of The SUPPER Project. All providers agreed that substantive and positive parental communication with children is an integral part of preventing or delaying substance use and creating an open discourse between the parent and the child can promote prevention efforts as it allows children to feel more comfortable, rather than fearful, of coming to their parents with questions or concerns about their potential substance use behaviors or attitudes.

> Yeah, I would, I would say that parental communication is key, you know, kind of having a really good conversation about, you know, what it means to use substances and the consequences of that and really, you know, also, kind of getting at why kids feel like they need to, whether it's due to peer pressure, whether it's due to actually having mental illness, you know, or behavioral

> problems, and they're using to kind of deal with those problems. And so really, being open and honest about it, I think is more critical than kind of monitoring your kids in a way that I think can be really destructive.
> (Unknown age male, clinical psychologist of unspecified years)

> And you know, it's like the parent has to be number one, a role model, and they have to be involved when the when the adolescent is not necessarily making healthy decisions. And you know the relationship they have and the trust they have is going to be very important, for you know, the adolescent wanting to make changes and not, like, you know, revolting.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

Providers also reported that parents need adequate support, education, and/or training in order to navigate conversations regarding substance use prevention with their child.

> Especially communication, I think, is one of the biggest things, because it's like, yeah, I don't know if parents know how to have honest conversations where their child feels like they can open up without being judged and get the support they need. I mean, that's really hard. It's a skill and it requires a lot of support. So if you can provide something like that, more power to you.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

> …maybe just how to react if their child does say that they're participating in drugs or their friends are, and how the parent can anticipate like that conversation, because I could see certain parents getting really upset, or, you know, start not being able to regulate their emotions when that happens. So it may be something we need to counsel on beforehand, like, if this does come up, this is how you should handle it, just so that they're prepped for it ahead of time.
> (29 year-old female, physician assistant of <3 years, primary work in outpatient clinic)

One provider mentioned that parental communication is key to the success of a family-based intervention, but the interpersonal relationship between the parent and child is an important consideration for the program to be effective.

> So the child has to feel comfortable talking to their parent, and vice versa, before it would be helpful for them to have conversations again about it. I feel like if a child doesn't trust their parent or feels like they're gonna judge them or punish them by talking about it, then it's not really a good dynamic. But I think in like healthy relationships between child and parent, it's really helpful, you know, to have someone where you're getting knowledge from your parent, and you're feeling like you can share with them and talk to them about what's going on at school.
> (29 year-old female, physician assistant of <3 years, primary work in outpatient clinic)

Adoption Theme 3: Various levels of barriers to adoption exist.

Providers reported on their perceived facilitators and barriers to the adoption of The SUPPER Project within their respective clinical settings. Providers primarily focused on describing barriers to adoption surrounding two majorly identified sub-themes, provider-level

barriers and clinic-level barriers. It is important to note that these barriers, if present at the adoption phase, also pose an obstacle to program implementation and maintenance and thus go hand in hand with multiple stages of the RE-AIM framework.

Adoption Sub-Theme 1: Provider-level barriers.

Regarding provider-specific barriers, providers reported multiple impediments to adopting The SUPPER Project in practice. Repeatedly, providers reported that a perceived shortage of time is one of the largest barriers to adopting and integrating a new program into existing workflow. Providers report that multiple competing tasks and subjects to address during a clinic visit, like vaccinations, limits the time that providers have to adequately discuss substance use prevention with the children. Some providers stated that a lower level of familiarity or rapport with the parent and child could decrease the amount of time left to address social and behavioral topics like substance use.

> …the thing is, pediatricians have so many competing things that they have to manage. You know, they have to do well visits. They have to do vaccinations. They need to talk about seatbelts and, you know, puberty and stranger danger and all of the immediate, you know, and social media use that, you know, when do you put in substance use conversations?
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> I mean, the biggest one is time. Right? We, I work in an academic setting where we have 30 minutes for visits, that is extraordinarily generous. Most primary care settings are getting like 15 minutes, maybe 20 for visits, if not shorter, for some of their well visits for care of, like, you know, their follow up visits for youth. And if you've ever seen the like Bright Futures table about what you're supposed to do in a well visit, I mean the idea that any of it would fit into 15 minutes is kind of comical. So time is a huge issue.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

Some providers also report a perceived feeling of being ill-equipped to discuss substance use prevention with children due to a perceived knowledge-gap of the subject and techniques to address it. Some providers reported receiving no substance use education or training during their entire academic, residential, or fellowship careers, thus contributing to a perceived feeling of inadequacy in broaching or discussing the subject with their child patients.

> None of us received any substance use training in our pediatrics. You know, it's really not in medical school at all, and it's not in the pediatrics curriculum. You know, and we receive a lot

> more training about leukemia, or even rare diseases that kill a lot less children than substance use does.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> Like as a primary care clinician like what do I need to know, and what are the techniques that would be most effective in talking to a fifth to seventh grader, and the parent of a fifth to seventh grader, about this subject? Like, there's some skill there that I think a lot of clinicians would doubt that they had. So that kind of lacking, a kind of a self-perception of lacking in that skill and a lack of time makes it such that probably not much is discussed usually.
> (Unknown age male, physician of 20+ years, primary work in outpatient clinic)

Providers report a general feeling of being overwhelmed within their current clinical responsibilities and generalize the feeling towards other clinical staff and clinicians within the field of medicine, which may be a barrier to a clinical site in adopting a new program like The SUPPER Project into practice.

> But I can just tell you that when there's more stuff that's given to a clinic to do when we're already over strapped and trying to meet all of our other things like, yes, we would love this in theory, but I don't know if anybody would have the capacity to take this on.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

> If you then say so, do you want to do it at your practice? They're gonna say, 'Oh, my practice? We're so busy… we have so many things, I can't just deal with one more thing,' and that's the big barrier you're going to face.
> (Unknown age male, physician of 20+ years, primary work in outpatient clinic)

Additionally, providers discussed the issue of patient-provider confidentiality as a potential barrier to adoption. For current substance use prevention practices within their clinics, providers prefer to initiate the conversation with the child while the parent is not in the exam room. Providers report that child privacy helps facilitate the child feeling comfortable to be transparent about their substance use behaviors and attitudes without fear of retaliation by the parent. Thus, providers suggest that the interventionist component of The SUPPER Project may not align with provider's current prevention efforts while maintaining confidentiality in the sphere of the private aspect of the clinical appointment.

> I mean the thing that can come up is if something's going on with the kid and the kid doesn't want the parents to know. And that can be an issue.
> (Unknown age female, physician of 20+ years, primary work in outpatient clinic)

> Well, I usually don't have the conversation with parents, because I usually kick them out and have the conversation with the kid. And if it if the parent was to bring something up with me like, 'Hey, I'm concerned about this,' and then we would have a joint discussion.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

> It can be challenging to talk about this when the kids in the room and the parents in the room, because the kid is inevitably gonna say, like, 'Don't worry, mom. I'm never gonna do that,' or whatever.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

Adoption Sub-Theme 2: Clinic-level barriers.

Providers mentioned barriers on the clinical level which could impede the adoption of The SUPPER Project into practice, such as staffing resource gaps which could influence both the adoption of the program and follow-up with the families and children. Providers also mentioned physical space as a resource barrier, which could be an impediment to an interventionist having room to sit down and talk with the families about the contents of The SUPPER Project. Providers responded positively to The SUPPER Project's handbook conceptually as it addresses a portion of the perceived resource gaps.

> Yeah, time, training, resources. You know, if you discover that there's a need, you know, and your next patient is waiting, and you only have one room, and, you know, who do you hand them off to? Sometimes you're lucky, and there's a good social worker that can come in and chat with them and extend the visit. But most of the time that's not the case.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> But I don't have a lot of great resources, I feel like, to provide to the family and the child if they you know, if they request it, and just to provide in general. So, I think The SUPPER Project sounds very beneficial, in my opinion.
> (44 year-old female, physician assistant of 20+ years, primary work in outpatient clinic)

> And there are no recommendations from things like Bright Futures which is the American Academy of Pediatrics like 'This is what you do for anticipatory guidance in pediatric primary care.' It doesn't talk about like a memo to give parents at a certain age that is anticipatory guidance around alcohol or any other drug use.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

Additionally, the adequate presence of available in-person or virtual translators for non-English speaking families within the clinic could pose a barrier to adoption. Parents or children aren't fluent in English or experience other communication barriers may not be able to

participate in the program if the clinic is under-equipped, and it was brought up that this could be a particular hindrance to the two interventionist sessions as they would require an in-person or live translator.

> I really feel that language is probably the biggest barrier second, to like the technology part, because the child might know how to speak English, but the parent might not, you know. And so that adds another piece to your program. Where, like, now, you have to get like translators right for these two conversations. So that's a little bit difficult. And I feel that the like having an in-person translator is way better. It's more personal, and you might get more out of the out of the conversation. The child, the parent than like a tele, you know, like one of those iPad type of translators.
> (Unknown age female, physician assistant for 15-20 years, primary work in hospital)

Implementation & Maintenance Theme 4: Facilitators to implementation and maintenance.

Providers report that the implementation of a prevention program like The SUPPER Project should involve very minimal provider time and effort in order to be successful within the clinical setting. Providers elaborated on this by recommending recruitment and delivery mechanisms of administering The SUPPER Project that do not require much of the provider or clinical staff effort. Additionally, some providers reported that exploring other settings like schools or community-based organizations could be another effective strategy of implementation.

Implementation & Maintenance Sub-Theme 1: Creation of a minimally involved parent-child recruitment and program delivery mechanism.

Providers reported that a recruitment mechanism should exist outside of the provider's time with the patient in the clinic due to impeding time and resource constraints and previously discussed barriers. One provider expressed negative emotions towards previous experiences with research projects in which they were asked to utilize some portion of their time with the patient on describing or implementing portions of a project or program. Several mechanisms for recruitment and program delivery were recommended, such as a form of a visual medium recruitment process like a marketing poster or one-pager hung up within the exam room, waiting

rooms, or bathrooms and scannable QR codes which can download The SUPPER handbook or assist in recruitment.

> They attach the flyer and they go, ‘Could you ask them to do this during your visit?’ I'm like, no. I'm busy, like, I don't have time for that. I don't. I don't have time to explain what your project is and why, where I'm asking you in particular. That's your research project, like, so sorry. That was a very visceral response. But you can't, you can't… you know, for something like SUPPER, which is a pretty intensive project, and it sounds great, you have to, you have to staff it with not the providers to do the work. The providers can provide the patient population, and you know, the access, and even the location and timing. But the rest of the work has to be done by somebody else.

> But you know, posters in the waiting room, I think they're a good way to kind of get started. Putting things up in the bathroom with the QRS code, so that if you have more questions like, you know, say, The SUPPER pamphlet was gonna go like, you know, big time, put a flyer up in the bathroom with the QRS code so they could download it as a PDF. Like that's great, you know, just even in the waiting room, I think, particularly in this age group, you could put one that's really geared toward an 11 to 13 year old, and then another poster that's geared towards the parents.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> But if it's something that you know, parents has the opportunity to sign up for, and it's offered, and then The SUPPER program sort of takes things from there, and it's virtual, I don't see any problem. You know, I don't know if everyone's gonna be willing or happy. I think it's probably something that clinics might like.
> (Unknown age female, physician of 20+ years, primary work in outpatient clinic)

> And you could um have people sign up and all without the doctor. The only thing the doctor would need is to know that it was being offered, so that if the patients asked questions they're prepared to answer it.
> (Unknown age male, physician of 20+ years, primary work in outpatient clinic)

In terms of program delivery to the family, providers reported positively to The SUPPER Project being able to be delivered by a provider or clinical staff member such as an office manager, psychologist, social worker, substance use counselor, and/or nurse. However, providers expressed concerns in terms of hiring, funding, and staffing these team members. Some providers mentioned that utilizing a team member previously untrained in the field of substance use, such as a medical assistant, might not be advisable due a level of clinical skill required to act as an interventionist.

> I think that nursing is a very good position to utilize. They have, I mean, I'm a nurse practitioner so I have kind of the background of understanding like the holistic medicine aspect of it and really the how to reach the families, how to discuss it with them in a way that they will understand and

> be receptive. I think that nursing is probably the best to do that, but I also know that they are probably the busiest.
> (31 year-old female, nurse practitioner of 3-10 years, primary work in outpatient clinic)

> So I think the provider would be the one to hand the resource and provide the resource and talk to the family about the resource itself. But the one-on-one, I think, you know, in a perfect world it would be the provider, you know, having those conversations, but realistically, I know that is probably not possible… I feel like the medical assistants, it might be a challenge for them to be able to answer questions, you know, unless they're properly educated ahead of time.
> (44 year-old female, physician assistant of 20+ years, primary work in outpatient clinic)

Implementation & Maintenance Sub-Theme 2: Exploring community and school-based implementation efforts.

Some providers reported that considering community-based organizations and schools can be another avenue to explore for further implementation of The SUPPER Project, partially due to the resource constraints within the medical system and due to the potential infrequency that providers see their pediatric patients within the clinic being a limiting factor to the success of The SUPPER Project.

> Yeah, I mean, we always are kind of mirroring schools sometime, you know, we, we think about counseling and preventative measures in conjunction with schools a lot of times, and I think that might be a great place to support kids as well. You know, we see them once a year. They see them every day. So that's definitely something that could be useful.
> (31 year-old female, nurse practitioner of 3-10 years, primary work in outpatient clinic)

> So looking at community based organizations, you know. There's programs like the Boys and Girls Club, the Y.M.C.A. We have, you know, a lot of local community programs and community centers in Boston that do a lot of programming, you know. So I think even, you know, after school programming, if there's after school programs in the communities. Even looking at church programming. You know, particularly if a child is attending church, their family is probably involved, right?
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> It could be something that when the parents go for like a first night of type of event, when their child is starting school, it could be given to them at that moment. And sort of plant the seed that way. There could be like a sign-up thing where you know, if they want more information they can, you know, sign up to get the messages. I also think it could be on the teacher's radar, right? So if they see that a child's behavior is changing, they see them every day, right? So they're probably the best eyes on that child, and if they see their behaviors changing.
> (Unknown age female, physician assistant of 15-20 years, primary work in hospital)

Implementation & Maintenance Theme 5: Barriers to implementation and maintenance.

Barriers to implementation and maintenance are in conjunction with barriers to adoption of a prevention program like The SUPPER Project, but also take into consideration the long-term delivery of the program in clinical practice. When it comes to this aspect, providers most often discussed the interventionist portion of The SUPPER components to being the largest barrier to long-term delivery of the prevention program.

Implementation & Maintenance Sub-Theme 3: Delivery of interventionist sessions.

Providers expressed concern in fulfilling the third component of The SUPPER Project faithfully, the two one-on-one interventionist visits, due to previously mentioned barriers but also in terms of finding someone to fulfill that position within the clinic and finding the time to conduct the interventionist visits, and then offered additional recommendation to address some of these issues. Some providers suggested that a new position would need to be created due to the existing task load of employees. This ties closely to the clinic's infrastructural capacity to take on The SUPPER Project.

> You've got to have space, time, dedicated staff. You can't ask anything of the existing staff. You'd have to bring your own staff, and it would have to be funded.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> Yeah, I think that's the… that's your feasibility issue right there. Is that if you're not paying them, it's gonna be hard to convince them to use their time for it. If it were the trial staff doing the one-on-one, it's going to be an easier sell.
> (Unknown age female, physician of 20+ years, primary work in outpatient clinic)

> The provider ask to do 45 minutes of talking to parents is going to be functionally impossible [laughs]. Nobody has, you know primary care providers in an academic setting don't feel like they have time to add things. And in a community setting, I mean, you guys know this, I'm sure, but like any primary care providers, particularly family medicine providers who are, who see the vast majority of kids in the US, like just don't have bandwidth right now, and they don't have time, and they don't have… they can't cover what they've been supposed to be covering for the last 10 years. So I think the desire would be there, and a real concern about like what is this adding to my practice would also be there.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

Similarly, some providers expressed concern in enrolling and scheduling families to complete the two one-on-one interventionist visits. Some providers suggested that this should occur during a time outside of the existing clinical appointment. Other providers mentioned that these visits, if done with a provider, might not fit into the financial structure of the clinic's operations.

> So you know you would need to be able to recruit them outside the time window of the actual appointment. You can't delay the appointment, so you can't try to recruit them 5 minutes before the appointment, because then they're gonna get pulled to get the vital signs.
> (50-year-old female, physician of 20+ years, primary work in outpatient clinic)

> I mean, the biggest thing with us, anytime you're doing a new clinic, or anything like this is the provider might be really interested in doing and wanna do it. But if you're not able to generate enough people during a certain number, during certain number of hours, then it's not going to make money for the clinic, and that provider is not going to want to do it, because then they have to make up the time elsewhere.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

> But I will say they would probably be pretty hesitant unless this is something that could be billable, which sometimes it is, preventative appointments can be billable and part of like our patient hours. But I think if it wasn't something that's billable it would be hard, because we only have so much time to see all our patients and complete our admin work, and it may look to the administration as us not doing anything during that period, even though it of course it is helpful. It's just not something they make money off of.
> (29 year-old female, physician assistant of <3 years, primary work in outpatient clinic)

Providers reported some recommendations for modifying the interventionist sessions to better be able to implement The SUPPER Project into the clinical setting. This included modifying the two 30 minute-1 hour sessions into shorter, 15 minute sessions every couple of weeks, turning the sessions into purely telemedicine or email-correspondence visits, and hiring separate, dedicated staff to serve as the role of the interventionist such as parents who have previously gone through the program. Some providers also suggested modifying interventionist visits to be group-based sessions with multiple parents and one interventionist.

> And the other thing I was going to say is, I guess I like the 30 min at the beginning, although maybe it should be a little shorter. I feel like having some shorter interventions along the way, maybe 15 minutes, like every couple weeks to see how it's going and offer advice, is important.
> (Unknown age male, physician of 20+ years, primary work in outpatient clinic)

> Maybe, you know, a lot of electronic medical records now that are utilized in these practices, have like a portal system that they can utilize to reach out to the office and vice versa, and to communicate. So I almost think that that might be a great opportunity, you know, where maybe it's not a one-on-one, but maybe through email, you know, through the portal, have that connection.
> (44 year-old female, physician assistant of 20+ years, primary work in outpatient clinic)

> And so if you had a world where you could hire, like parents, or even community health workers, or something like that, to provide intervention. I think that's probably ideal… I think I think somebody who can say like, 'Hey, this is what I talked about with my kids. This is how it went' would be incredibly helpful.
> (34 year-old female, physician of 3-10 years, primary work in outpatient clinic)

> …maybe having some type of like shared parent discussion where it's not just like not only one-on-one support for parents, but a chance for parents who are concerned, or want to be involved to come together. So kind of like a support group, but also a way to share like pearls and best practices like, 'how do you have these conversations?' or, 'yeah, I was concerned when I heard this, too, about from my child,' or 'this is something that I've been concerned about, that I never expressed to anybody' so being able to have, like other people to talk to, I think, is really important too, for parents, I mean, I think the one-on-one step is so important, you know, between the parent and some kind of counselor or person who's supporting them.
> (41 year-old female, physician of 10-15 years, primary work in outpatient clinic)

Discussion and Recommendations

This study intended to obtain the perspectives of pediatric and adolescent medicine healthcare providers practicing in the Greater Boston area on the feasibility of implementing a substance use prevention program, The SUPPER Project, into clinical practice. These perspectives are integral to obtain to inform the future of The SUPPER Project's implementation efforts practically into the community. I conducted remote key informant interviews with a selection of healthcare providers and/or professionals practicing healthcare in the fields of pediatric and adolescent medicine and analyzed themes using a reflexive and inductive approach.

At the "Reach" level of the RE-AIM framework, which intended to assess healthcare providers' perspectives on the intervention's applicability to the target audience within the scope of their clinical practices, providers reported that parents were sometimes concerned regarding adolescent substance use in their middle school aged children, and providers also

demonstrated varying level of concerns though most providers interviewed did report being moderately to severely concerned about the subject within the scope of their clinical practice. Previous literature which surveyed parents of 14- to 16-year-old children showed parents possess a moderate concern in relation to drug-related issues in their children, but this concern is elevated in terms of illegal substances due to their greater potential for harm as opposed to substances like alcohol.[15] However, the referenced study interviewed parents of high-school children rather than middle-school children, and thus the parental concern may be elevated for older children than what was observed within the context of this study. More recent studies interviewing parents of children aged 13 to 17 across the United States similarly reported that parents are more likely to engage in help-seeking behavior from substance use specialists when their children engage in illicit drugs or opioid use, and that help-seeking behavior targeted at general medical professionals like doctors or psychiatrists were low.[16] This referenced study also demonstrated that parent's preferred mode-of-intervention when discovering their child is engaging in non-illicit substance use is to talk with the child or punish them, rather than speak with a medical professional.[16] Partially, this could be due providers having a generally low rate of screening and discussing substance use prevention with their patients, as reported by multiple studies.[8,16,22] This corroborates the findings of this qualitative study, in which pediatric providers did report that parental level of concerns varied greatly, with a majority of providers stating the parental level of concerns regarding adolescent substance use was low within the 5^{th}-7^{th} grade age group.

At the "Effectiveness" level of the RE-AIM framework, which assessed how effective providers felt the parent-involved intervention is, providers positively reported that parent-child communication is key and thus an effective tool for adolescent substance use prevention when utilized appropriately. Providers also noted that parents need to have significant support and education or training in order to navigate these difficult conversations with their child as part of the prevention program. This concept is corroborated by literature, as one extensive review of

the efficacy of peer-reviewed and published outpatient adolescent substance use disorder programs showed that family-based interventions were supported by a large amount of evidence.[17] Multiple other analyses of programs confirm that parent involvement, monitoring, and parent-child communication regarding substance use can reduce adolescent substance use initiation or reduce frequency of adolescent substance use,[4,18,20] which aligns with the long-term goals of The SUPPER Project. Reviews of other family-based interventions have also suggested that providers believe that involved family members would benefit from written information, interactive information, training sessions, and educational videos to improve the program fidelity and efficacy of a family-based intervention.[19] In terms of parental education, The SUPPER Project intends to address potential parental information gaps by providing the parents a handbook which contains information and statistics about adolescent substance use, websites and links with additional resources for help, and conversation prompts which are tailored to help parents initiate a conversation with their children about adolescent substance use and substance use behaviors. Additionally, parents are also signed up for weekly text messages which help reinforce the handbook content and serve as short reminders and tips for parents in discussing substance use, and parents also engage in two one-on-one interventionist visits which serve as an individualized informational and educational session.

At the “Adoption” level of the RE-AIM framework, which aimed to see how well-equipped providers were to adopt the intervention into their clinical practices, providers emphasized multiple barriers to the successful adoption of the prevention program. On the provider level, providers mentioned potential gaps in knowledge regarding substance use, lack of enough time to discuss the prevention program and incorporate it into the visit, an overarching feeling of being overwhelmed with other tasks, and potential misalignment with current clinical prevention practices preferring patient-provider confidentiality as all being barriers to adoption. On the clinical level, providers mentioned a shortage of resources such as rooms/space, staff, or other supplementary resources like in-person or virtual translators as being barriers to adoption.

On the provider level, the concerns the providers mentioned are corroborated by previous literature, such as one recent publication that showed that issues such as limited provider knowledge and familiarity with intervention or screening tools and limited addiction medicine training have correlated to lower uptake of developed screeners for adolescent substance use being incorporated into the workplace.[8] Additionally, perceived lack of time for providers is a commonly reported barrier along with a perceived limited privacy to speak with the adolescent during their clinical appointment,[21-22] but one recent study of Massachusetts adolescent medicine providers reported that most providers are able to offer brief advice, counseling, and referral to treatment for substance use in 5 minutes of less.[8,21] The same study suggested from their collected data that any interventions which are intended to last more than 5 minutes, as is the case with The SUPPER Project's interventionist visits which are intended to last between 30 minutes to 1 hour, would be more feasible if delivered by staff outside the provider such as a nurse, behavioral specialist, or clinical assistant.[21] This is strongly supported by the providers' perspectives shared during this study, as most providers agreed that while providers would be an optimal choice for acting as the interventionist, time constraints would be a major inhibitory factor to doing so, but nursing or allied health professionals are an appropriate, suggested substitute.

On the clinical level, resource gaps such as educational materials to hand out to patients and physical space such as exam rooms to conduct the interventionist visits were brought up as being potential barriers to adoption. One previous qualitative study of pediatricians at Boston Children's Hospital did identify a lack of "treatment resources" for adolescent substance use to be a common barrier for pediatricians screening adolescents,[22] and while physical space was not mentioned to be a barrier by the study's healthcare providers, it is still an important consideration depending on how the interventionist visits are ideally conducted in a clinical setting. Many providers suggested virtual visits to be a consideration, and exploring this avenue of delivery further can be one potential resolution to a physical space issue that clinics may or

may not have. Additionally, since The SUPPER Project is a prevention program, rather than a treatment program, which intends to address the resource gap by providing providers with a handbook to deliver to patients, we do not anticipate existing resource gaps to be a majorly relevant barrier but rather a facilitator to adoption of the program.

Language barriers with the parent or child is also a valid concern that could impede program adoption, particularly in clinics which serve large non-English speaking populations. The previously mentioned qualitative study at Boston Children's Hospital determined that language and communication barriers had relatively low scores of being impediments to pediatricians discussing substance use prevention as compared to insufficient time, lack of training, and a need to triage competing medical issues,[22] and this can partially be due to the availability of virtual or in-person translators being available at the facility or a low non-English speaking patient make-up. This is an important consideration to make The SUPPER Project reach a wider audience in the future of implementation and expanded translated materials and/or availability to translators should be considered depending on the site of implementation.

At the "Implementation and Maintenance" level of the RE-AIM framework, which aimed to determine the logistics of implementing the program into the clinical setting and delivering the intervention consistently in the future, providers discussed both facilitators and barriers to implementation and maintenance of a prevention program in practice. Facilitators included creating a recruitment and program delivery methodology which involves as little of the provider's time or resources as possible and exploring other settings such as schools and community-based organizations for implementation due to the infrequency of children's visits to the primary care office. Barriers to implementation were described as mostly having to do with the current clinical infrastructure, which presented as a reoccurring issue of delivering the two one-on-one interventionist sessions with the families, while the handbook and text message components of The SUPPER Project were not reported as an explicitly difficult thing to implement.

Facilitation of implementation by reducing the provider's physical involvement is a major consideration as it was brought up in the greatest number of contexts throughout this qualitative study. This can be conceptualized by creating educational posters with scannable QR codes and downloadable plus physical versions of the handbook available in both the waiting and exam rooms as multiple providers suggested. Minimizing provider involvement in acting as the interventionist would require, as mentioned previously, using other allied health professionals or nursing staff to be trained on administering the sessions and scheduling patients. Utilizing a virtual platform for scheduling and conducting the interventionist sessions or adapting the sessions to phone-calls only were some mechanisms of delivery mentioned which could alleviate provider burden on implementation. One review of computer-assisted interventions in the field of behavioral health has shown that computer-assisted therapy for delivery of interventions in the clinical setting is more cost-effective, standardized, decreases provider burden and time spent, and can be a valuable way to extend clinical care.[23] Adapting the interventionist sessions to a virtually accessible format, perhaps through the use of interactive modules, through online video-conferencing calls, or through pre-recorded videos could be another consideration for facilitating implementation which minimizes both provider and clinic burden and resources. However, clinical implementation should be done on a case-by-case basis and is ultimately dependent on the individual clinic's infrastructure, capacity, and perceived need for a prevention program, and buy-in would first be determined on the departmental or directorial levels of the clinic.

The SUPPER Project's implementation in school settings is already being considered through the primary randomized controlled trial, and looking into the future of community-based organization implementation can be another consideration due to the relative infrequency of the average child's visit to the pediatrician, as many providers brought up. One report from 2013 which analyzed middle and high school substance use prevention programs in the U.S. found that a majority of schools sampled in the study had at least 1 prevention program, but schools

with a higher socioeconomic status had a higher average of prevention programs offered,[24] and regardless, many of the country's middle schools do not offer substance use prevention curriculums which are evidence-based.[25] Additionally, it is estimated that only about 69% of adolescents and 53% of young adults receive a preventive visit annually,[26] which contributes to the difficulty of follow-up that many providers mentioned throughout this qualitative study. Expanding efforts into schools and potentially community-based organizations such as the Y.M.C.A. and Boys and Girls Club could be one avenue of exploration for future implementation efficacy studies.

The findings of this comprehensive study hold implications for the practice of public health, particularly in the context of substance use prevention among pediatric and adolescent populations. By elucidating the perspectives of healthcare providers in the Greater Boston area, this research contributes valuable insights to inform the future implementation of The SUPPER Project, thereby addressing a critical gap in current prevention practices. The emphasis on positive parent-child communication, the need for parental support and education, and the identification of barriers at multiple levels underscore the complex interplay of factors influencing the success of prevention programs. Importantly, the study highlights disparities in parental concerns and provider resources, emphasizing the need for tailored approaches to accommodate diverse socio-economic and linguistic backgrounds. The consideration of language barriers and the suggestion of expanded translated materials or availability of translators speaks directly to the importance of health equity. Furthermore, the exploration of alternative settings, such as schools and community-based organizations, acknowledges the infrequency of pediatric visits and seeks to extend the reach of preventive interventions. The facilitators and barriers identified at various levels of the RE-AIM framework provide a roadmap for refining The SUPPER Project's implementation strategy, ensuring it is not only effective but also inclusive and equitable in addressing the unique challenges faced by diverse populations. Ultimately, these results and deliverables contribute to the advancement of public health

initiatives that strive to promote health equity by tailoring interventions to the specific needs and circumstances of the communities they serve.

Recommendations for the Direction of Implementation of The SUPPER Project

Based on the perspectives obtained from a variety of healthcare providers in the Boston area, I offer some recommendations to direct the future of The SUPPER Project's implementation into clinical and other relevant settings.

1. Clinics with a higher perceived need for a substance use prevention program, such as clinics serving a large and diverse demographic of patients, should be prioritized for clinical implementation of The SUPPER Project.
2. Buy-in for the prevention program should be first sought out by the directorial or departmental leadership at the individual clinic selected prior to implementation.
3. A visual recruitment mechanism for parents and children should be created for clinical implementation. This can include one-pagers or posters with scannable QR codes which can download a digital version of the handbook, enroll the parents for automated text messages, and potentially schedule the parents for their interventionist sessions without the involvement or with minimal involvement of the clinical staff. These one-pagers or posters should ideally be located within the waiting rooms, exam rooms, and bathrooms of the clinic.
4. The interventionist visits should be adapted for clinical implementation by reducing existing provider, staff, and clinic resource burden. This could be done by moving the visits to phone-call only, to teleconferencing software, or through creating an interactive video, stand-alone videos, or self-paced module series that wouldn't require existing staff participation or use clinic space.
5. Interventionists in the clinical setting should ideally either be an existing and dedicated SUPPER Project staff member or a nursing, social work, and/or behavioral health

professional within the clinic, rather than the primary health care provider themselves. However, using an existing staff member will require significant buy-in and training the clinic staff on administering the program, while also incorporating it into the schedules of the existing staff members on a case-by-case basis. It may also not be feasible unless a financial incentive or billing and coding structure is created by the clinic due to the other competing responsibilities of the healthcare staff. Utilizing a parent or community member to act as an interventionist is also one avenue to explore which was suggested to bypass this issue.

6. Another suggestion is moving interventionist visits into group-based sessions with multiple parents and one interventionist if it is more feasible than adapting the interventionist sessions into a virtual format. These sessions will most likely have to be held by an existing SUPPER team member and would likely be conducted outside of the clinic due to potential space constraints.
7. Multilingual versions of the handbook, text messages, and provided translator services for the interventionist sessions or multilingual virtual interventionist sessions should be considered for the majority non-English speaking patient-parent demographics at the respective clinics. Providers specifically mentioned a need for Spanish, Portuguese, and Haitian-Creole materials as a preliminary baseline prior to implementation in a clinical setting to improve uptake and delivery.
8. Considering primary implementation at the school-level or community-based organization level prior to clinical implementation is important, as reported by providers, as school attendance compared to clinic attendance can be a major facilitator to program reach and effectiveness. Examples of CBOs to explore that were mentioned include the YMCA, Boys and Girls Club, religious institutions, and the Department of Children and Families.

Limitations

This study has some limitations. Firstly, this study is specific to The SUPPER Project's implementation efforts and the interview guide was developed to better capture participant responses in relation to the three components of The SUPPER Project's intervention, and thus the results of this study are potentially not generalizable to other or overlapping substance use prevention programs. Secondly, purposive and snowball recruitment was utilized to recruit an array of healthcare professionals with different positions, titles, place of work, and years of experience; however, because the inclusion criteria focused specifically on Boston-area providers, data collected from these participants may not be transferable to program implementation efforts in different communities and regions of the United States or to healthcare provider shortage areas. All the participants held doctoral degrees or professional certifications in their field and possessed relevant experience in the fields of pediatric or adolescent medicine. However, because of the sensitive nature of substance use, I acknowledge that each participant may or may not possess their own biases regarding substance use/substance use prevention importance and thus, their perspectives may not necessarily represent the opinions of all healthcare providers in the city of Boston, Massachusetts, or the United States. Additionally, recruitment effort was targeted to recruit a sample size that would ensure thematic saturation, which was done and corroborated with the preceptor overseeing this study. Future qualitative studies using a more geographically diverse and/or site-specific sample of participants should be considered to better understand how location, community resources, and healthcare saturation could affect the implementation of The SUPPER Project into practice. Finally, all the interviews were conducted remotely, which created barriers that came up during the study including signals being lost and occasional audio or video interruption. While these issues were resolved and did not compromise the content of the qualitative data analysis, it should be

mentioned as a potential limitation as technological interruptions could compromise the timing, train-of-thought, and responses of participants in future studies and should be considered.

Conclusion

In conclusion, this research study has provided valuable insights into the feasibility of implementing The SUPPER Project, a substance use prevention program, into clinical practice within the Greater Boston area. The study, guided by the RE-AIM framework, has highlighted several key findings at different levels of implementation. At the "Reach" level, it became evident that parental and provider concerns about adolescent substance use varies and may be influenced by the child's age and prior awareness regarding adolescent substance use. The "Effectiveness" level emphasized the importance of positive parent-child communication and the need for parental support and education, aligning with existing literature on family-based interventions. At the "Adoption" level, several barriers were identified including resource shortages both on the provider and clinical level. The study also underlined the potential benefits of involving nursing or allied health professionals in the delivery of the program. Finally, at the "Implementation and Maintenance" level, the study suggested the need to minimize the provider's physical involvement by exploring alternative delivery methods, such as virtual platforms or school-based and community-based organizations. These findings are instrumental in guiding the future implementation and refinement of The SUPPER Project, with a focus on addressing the identified barriers and leveraging facilitators to ensure the program's successful integration into clinical practice and other settings.

Authors/Acknowledgements

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Abbreviations

ALE	Applied Learning Experience
APE+ILE	Applied Practical Experience & Integrated Learning Experience
APRN	Advanced Practice Registered Nurse
CBO	Community Based Organization
HCP	Healthcare Provider
MD/DO	Medical Doctor/Doctor of Osteopathy
NP	Nurse Practitioner
PA	Physician Assistant/Associate
RE-AIM	Reach, Effectiveness, Adoption, Implementation, and Maintenance
QuEST	Qualitative Estimation for Systemic Translation
REDCap	Research Electronic Data Capture
SBER IRB	Social, Behavioral, and Education Research Institutional Review Board
SBIRT	Screening, Brief Intervention, Referral to Treatment
SUD	Substance Use Disorder
SUPPER	Substance Use Prevention Promoted by Eating family meals Regularly
VoIP	Voice over Internet Protocol

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Appendices

Appendix A. IRB Exempt Determination

Tufts UNIVERSITY | Office of the Vice Provost for Research

EXEMPT DETERMINATION

August 28, 2023

Margie Skeer
Tufts University
Margie.Skeer@tufts.edu

Dear Margie Skeer:

On 8/28/2023 the IRB reviewed the following protocol:

Type of Review:	Modification / Update
Title:	RE-AIM based post-implementation study for The SUPPER Project
Investigator:	Margie Skeer
IRB ID:	MOD-05-STUDY00002744
Funding:	National Institute on Drug Abuse, Grant Office ID: NIH025
Documents Reviewed:	• Grp4_Provider_InformedConsent, Category: Consent Form; • Grp4_Provider_InterviewGuide, Category: Study Instruments/ Participant-Facing Material;• Grp4_Provider_RecruitmentEmail, Category: Recruitment Materials;• Grp4_Provider_REDCapSurvey, Category: Study Instruments/Participant-Facing Material;• REAIM Protocol, Category: IRB Protocol;

Institutional Review Board (IRB) has reviewed the modifications to the above-referenced project and has determined that it remains exempt. **This MODIFICATION serves to** add a fourth group of individuals to the study population.

The Exempt Status of the protocol does not relieve the investigator of any responsibilities related to the research participants. In conducting this protocol, you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. Before making changes to the study procedures or documents, please submit a Modification to ensure that the regulatory status of the study has not changed. Changes in study personnel must also be submitted to the IRB through a modification.

Annual continuing review and approval by this organization is not required.

Sincerely,

Linda Spang
IRB Analyst II

Social, Behavioral, and Educational Research • Institutional Review Board • FWA00002063
75 Kneeland Street, 6th Floor, Boston, MA 02111 • T: 617.627.8804 • E: SBER@tufts.edu

Appendix B. Semi-structured Interview Guide Questions and Script

Example RE-AIM-based Stakeholder (Healthcare Providers)
Semi-Structured One-on-One for Implementation of The SUPPER Project

Introduction

Good morning/afternoon/evening **[healthcare provider name]** and thank you for meeting with me today. My name is **[researcher's name]** and I am a **[insert title, position, school].**

You have been asked to participate as a healthcare provider because we would like to assess if the clinical setting would be an appropriate and effective setting to implement the project in the future. First, I will give you a summary of what The SUPPER Project is and why we asked to interview you today, and then I will get into the questions.

The SUPPER Project is a large-scale randomized control trial that is looking at a brief communication-based intervention aimed at preventing substance misuse among adolescents around 5th-7th grade age by improving parent-child communication. *The SUPPER Project is not a screening or brief intervention program but a prevention program, intended for all adolescents.* As a part of our intervention, parents, guardians, and/or caregivers (from herein referred to as "parents") receive a handbook, a referral packet with resources on health services and substance-related services, and weekly texts regarding substance misuse prevention. They also participate in a 1-on-1 session with a counselor (we refer to them as interventionists) who help the parents become more comfortable with talking to their children about sensitive topics regarding substance misuse. The goal of the study is to influence parents to have more open conversations about substance use with their children over the setting of family meals, hence the name "SUPPER" Project, to aid in adolescent substance misuse prevention. We enrolled approximately 400 parent-child pairs ("dyads") from across Massachusetts, and we recruited through schools along with other recruitment platforms.

Initial pilot study results from the RCT have shown us that this prevention program has been effective in helping parents have more candid conversations with their adolescent children about substance use/misuse.

Again, you have been asked to participate as a healthcare provider because we would like to assess if the clinical setting would be an appropriate and effective setting to implement the project in the future. We would also like to gain your insight on how this prevention program would fit into the clinical setting, your experience with prevention program implementation more generally, and recommendations you may have for its future implementation, whether in clinical or school settings.

Do you have any questions for me before we begin the interview?

Reach

1. How much of a concern do you feel that adolescent substance use/misuse is for parents, particularly for parents of 5th-7th grade aged children?
    a. *Probe (if answer is brief)*
        i. How often do parents bring up the issue of substance use with you during their appointments with their kids?
2. Can you tell me about how much of a concern is adolescent substance use/misuse for healthcare providers?

Effectiveness/Efficacy

3. Can you tell me your thoughts on the effectiveness of *parental monitoring* in adolescent substance use/misuse prevention?
4. Can you tell me your thoughts on the effectiveness of *parental communication* in adolescent substance use/misuse prevention?
    a. *Probe (if asks for clarification or answer is 'not sure')*
        i. For instance, what are your thoughts on the effect of parents discussing substance use/misuse regularly with their adolescent children (ex: over family meals) on substance use prevention?

Adoption

5. Can you tell me about what you typically do for adolescents (aged 5th-7th grade) and/or their parents regarding substance use prevention during a normal visit?
6. What practices are in place in your clinical workplace regarding adolescent substance use prevention?
    a. *Probe (if answers are brief)*
        i. Can you discuss when these practices are usually implemented? (Ex: only when prompted by the parent or every time?, does it matter the age of the child?)
7. How do you feel about the current recommendations for substance use/misuse prevention in your clinical workplace?
    a. *Probe (if answer is brief)*
        i. What led you to believe that?
8. Can you tell me about anything outside "standard recommendations" that you recommend to kids or parents regarding substance use/misuse prevention?
9. What type of resistance or barriers do you face in discussing substance use prevention with parents?
10. What about with adolescents?
11. What else would you do regarding substance use/misuse prevention in your clinical setting which you are not already doing or are limited in doing?

Implementation and Maintenance

SUPPER is designed to be given to all kids, regardless of their current health and wellness. It involves 3 parts – getting the handbook to parents, meeting with parents one-on-one and sending regular, automated text messages that reinforce handbook content. *Note: Use a visual to remind the participant of the components, if helpful.*

12. Can you tell me the extent to which a prevention program like The SUPPER Project could be something you or other providers would like to see implemented in clinical settings?
13. How much of a priority is implementing substance use/misuse prevention programs in your clinical setting, to you as a clinician? What about to your clinic?
14. What do you think your clinic's capacity is to deliver a parent-based intervention like The SUPPER Project?
    a. *If the healthcare provider ask for details about the specifics of what this would look like, interviewer can reiterate the components of The SUPPER intervention (see Appendix).*
15. Lastly, I want to talk more about what the logistics of adopting and implementing a program like SUPPER in a clinical setting would look like. When it comes to program implementation, can you tell me more about who would be making the decisions surrounding the program/implementing it in your workplace?
    a. *Probes (if answer is 'not sure' or 'I don't know')*
        i. Would it be an individual or a group effort by the clinicians in the office or hospital, or perhaps hospital administrators or department leads?
16. Can you tell me your thoughts on what clinical staff/personnel you think would be best for explaining and delivering the contents of The SUPPER Project to parents?
    a. *Probes (if answer is 'not sure' or 'I don't know')*
        i. What are your thoughts on staff like Medical Assistants, Nursing Assistants, Nurses, Psychologists, Physicians or Advanced Practice Providers being involved in the project delivery? Others?
    b. *If the healthcare provider asks for what their role would be:*
        i. What is the extent that you'd and/or other staff be able to recommend the intervention and deliver the handbook (and maybe go through some of it with the family)? What about providing information for the patient to sign up for texts and scheduling the interventionist appointments?
17. What concerns would you have about recommending an intervention like The SUPPER Project to families?
18. What settings do you see The SUPPER Project being most successfully implemented in and why?
    a. *Probes (if answer is 'not sure' or 'I don't know' or asks for clarification)*
        i. Where do you see an adolescent substance use/misuse prevention program being most successful? (Clinics, schools, or other?)
19. Lastly, can you tell me a little bit more about if you have any other recommendations that could inform The SUPPER Project's future implementation?

Wrap-up (Remaining Time)

Is there anything else you would like to share with the research team at this time?
I am going to stop recording now. Thank you for your participation in this interview.

APPENDIX:

Components of SUPPER intervention.

1. Providing parents the handbook and referral packet with resources on health services and substance-related services,
2. One-on-one conversation sessions with parents
3. Setting up automatic text messages to be sent to parents with reminders and tips

Appendix C. REDCap Survey Questionnaire for Healthcare Providers

By continuing with this survey, you consent to us keeping your response options from this survey. We will discuss consent regarding the interview portion at the beginning of the interview.

Q1. What is your age?
[Numerical free text response]

Q2. To which gender do you most identify?

A. Male
B. Female
C. Transgender
D. Gender-Variant/Non-Conforming
E. Prefer not to answer
F. Other

Q3. Are you of Hispanic, Latino, or of Spanish origin?

A. Yes
B. No

Q4. How would you describe your race/ethnicity?

A. American Indian or Alaska Native
B. Asian
C. Black or African American
D. Native Hawaiian or Other Pacific Islander
E. White
F. Multiracial
G. Other

Q5. How would you describe the title of your current clinical position? Please select all that apply.

A. Physician (MD/DO)
B. Advanced Practice Provider (PA/NP)
C. Advanced Practice Registered Nurse (APRN)
D. Clinical Social Worker (LCSW/LICSW)
E. Clinical Psychologist (PsyD/PhD)

F. Other

Q6. How many years have you practiced as a clinical provider?

A. <3 years
B. 3-10 years
C. 10-15 years
D. 15-20 years
E. 20+ years
F. Does not apply

Q7. In which type of facility do you primarily work?

A. Hospital
B. Outpatient clinic
C. School-based health center
D. Community health center
E. Other

Q8. Approximately how many adolescent patients (18 or younger) do you see per day?

A. <5
B. 5-10
C. 11-15
D. 16-20
E. 20-25
F. 25+
G. I do not see patients currently.
H. Other

Q9. How would you best describe the length of time you usually spend with each adolescent patient per visit?

A. <15 minutes
B. 15-30 minutes
C. 30-45 minutes
D. 45-60 minutes
E. 1-2 hours
F. 2+ hours
G. Other

Appendix D. Provider Recruitment Email Scripts

1st EMAIL TEMPLATE

SUBJECT LINE: Looking for pediatric & adolescent healthcare providers to participate in a short interview regarding a substance use prevention study

Dear **[Healthcare Provider Name]**,

I am a current PA and Master of Public Health student at Tufts University School of Medicine conducting my ALE (Applied Learning Experience) project, and I am looking for pediatric and adolescent healthcare providers to participate in a short informational interview over Zoom to discuss:

- The feasibility of implementing a substance use prevention program in a clinical setting
- Your experiences with any adolescent-tailored substance use prevention programs, if any
- Recommendations you may have that will inform the future implementation of The SUPPER Project

Your participation is voluntary but appreciated. It will consist of:

- A brief 2 to 3-minute online survey
- A 25 to 30 minute informational interview over Zoom
- $30 Amazon e-gift card as a thanks for your time and participation

The SUPPER (Substance Use Prevention Promoted by Eating family meals Regularly) Project, created by Dr. Margie Skeer at Tufts University School of Medicine, is a large-scale randomized control trial for a brief communication-based intervention aimed at preventing substance misuse among adolescents. More information on the trial protocol can be found here: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263016.

Would you be willing to participate in one of these interviews? If so, please respond to this email at your earliest convenience and I will work with you to find a time that works to have the interview. After scheduling the Zoom interview, I will email you a link to the survey to complete at your convenience.

If you are unable to participate in an interview at this time or if you have suggestions of other people we should speak with, please let us know.

I look forward to hearing back from you.

Best regards,

[RESEARCHER NAME]

Research Assistant

2ND EMAIL TEMPLATE

SUBJECT LINE: N/A (Reply to initial email)

Dear **[Healthcare Provider Name]**,

I am writing to follow up on my previous e-mail requesting an interview and completion of a 3- minute online survey for The SUPPER Project study. The interview will last approximately 25-30 minutes, will be conducted via the Zoom platform, and participants will be compensated with a $30 Amazon e-gift card for their participation. We will be asking you your thoughts on The SUPPER project's adoption and implementation in the clinical setting

and your experiences with any adolescent-tailored substance use prevention programs in your professional setting. Once again, here is a link for more information on the trial protocol: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263016.

Is there a time in the next **[time point]** that would work for you to schedule an interview? If you are unable to participate in a video interview at this time or if you have suggestions of other people we should speak with, please let us know.

Thank you!

Best regards,

[RESEARCHER NAME]

Research Assistant

3rd EMAIL TEMPLATE

SUBJECT LINE: N/A (Reply to initial email)

Dear **[Participant Name]**,

I am writing to follow up on my previous e-mail requesting an interview and completion of a 3- minute online survey for The SUPPER Project study. The interview will last approximately 25-30 minutes, will be conducted via the Zoom platform, and participants will be compensated with a $30 Amazon e-gift card for their participation.

Is there a time in the next **[time point]** that would work for you to schedule an interview? If you are unable to participate in an interview at this time or if you have suggestions of other people we should speak with, please let us know.

Thank you!

Best regards,

[RESEARCHER NAME]

Research Assistant

Appendix E. Final Developed Codebook

Codebook

Name	Description	Files	References
REACH		9	21

Healthcare concern	Referring to the level of concern that healthcare providers have regarding adolescent substance use prevention and programming.	9	11
Parent-child level of concern	Referring to parents and/or children being aware or unaware of the importance of early substance use prevention, its impact, and its reach within middle school-aged children. Possessing a gradient of concern for substance use prevention in middle school-aged children.	8	10
EFFECTIVENESS		9	13
Parental involvement	Referring to the providers' perspectives on the effectiveness of parent involvement, including parental monitoring and communication, on preventing substance use in adolescents.	9	13
ADOPTION		10	61
Existing clinical prevention efforts	Referring to the providers' perspective on their current or previous clinical workplace's adolescent substance use prevention measures, programs, or practices.	9	20
HCP & clinical barriers		9	41
Child confidentiality	Referring to providers' perceptions of child privacy during a clinical appointment being a potential factor in adequate substance use prevention dialogue with the patient.	5	10
Knowledge gap	Referring to providers' perceived or actual deficit in medical education or training which prepares them to address adolescent substance use prevention within their clinical setting.	3	4
Overwhelmed	Referring to the providers' perceived or actual feeling of being overwhelmed, busy, or juggling too many tasks during their routine care as being a barrier to adoption of The SUPPER Project.	5	8
Resource gap	Referring to providers' perceived or actual deficit in appropriate resources and help clinically which aids in their adolescent substance use prevention practices.	6	8
Time deficit	Referring to providers' perceived or actual lack of time within their clinical setting to address adolescent substance use prevention with their patients. Also, general time shortage for current responsibilities and duties within their workplace.	7	11

Parent-child barriers		0	0
Communication barrier	Referring to a parent or child, whose first language may not be English or who has other potential communication obstacles, having a barrier to participating in The SUPPER Project's components.	3	6
Home-life and resistance	Referring to parent's hesitation or resistance in addressing adolescent substance use prevention during their clinical appointments with their children. Referring to the home life of the family being a potential barrier for the adoption of the program within the home, including resistance to discussing substance use prevention.	7	11
IMPLEMENTATION & MAINTENANCE		0	0
Barriers to I&M		0	0
Clinic infrastructure	Referring to a potential barrier to implementation of The SUPPER Project in the clinical setting being limited or incapacitated existing infrastructure; broad terminology.	6	9
SUPPER component concern	Referring to a provider concern regarding the one-on-one sessions with an interventionist, the handbook, or text messages as part of The SUPPER Project.	9	24
Interventionist position	An interventionist concern which has to do with the hiring or allotment of a clinical staff member to perform the role of the interventionist.	6	7
Recommendations	Referring to a provider's potential recommendations for accommodating or implementing the components of the program into the clinical setting.	8	13
Timing	Referring to an interventionist concern which has to do with allocating time during the clinic visit for recruitment, discussion, or inclusion of the one-on-one interventionist session.	4	4
Facilitators to I&M		0	0
Minimal HCP effort	Providers suggesting that The SUPPER Project should involve very little of the existing clinical staff's time, involvement, or resources to be successful in implementation.	2	2
Other settings	Referring to the suggestion of utilizing schools, community-based organizations, or other locations	10	16

	outside of the clinic as a potential implementation setting for The SUPPER Project.		
Parental support	Referring to adequate support, training, or resources being available to parents as they navigate substance use conversations with their children via The SUPPER Project.	5	7
Program delivery role	Referring to suggested clinical or non-clinical staff that could be ideal for delivering and explaining the contents of The SUPPER Project to parents and families.	9	19
Recruitment mechanism	Referring to the process of enrolling/recruiting parents and families to participate in The SUPPER Project within the clinical setting, extending to being exposed to the handbook and signing up for automated text messages. Referring to recruitment through the use of visual media, including but not limited to, posters, one-pagers, scannable QR codes, and more.	3	6
Stakeholder buy-in needed	Referring to buy-in needed from certain stakeholders within the clinical setting prior to implementing The SUPPER Project within the clinical setting.	9	11

Appendix F. Competencies Assessed

As part of this APE+ILE project, five competencies will be assessed, which are described below:

1. Competency 1 (APE+ILE - Foundational): Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate.
   I will meet this competency by analyzing collected qualitative data from key informant interviews in clinical settings using NVivo software. I will also perform basic descriptive statistical analysis on collected quantitative data, such as clinician age and years of practice from a brief questionnaire, using the statistical software StateSE.
2. Competency 2 (APE+ILE - Foundational): Interpret results of data analysis for public health research, policy, or practice.
   I will meet this competency by interpreting data collected from key informant interviews to inform the applicability of the implementation of The SUPPER Project (a public health research project) into future clinical practice. This will be done through qualitative analysis of key themes and trends that arise during the key informant interviews, and the results will be interpreted to inform The SUPPER project.
3. Competency 3 (APE - Concentration specific): Articulate a rationale for bringing public health perspectives and methods to clinical practice.
   I will meet this competency by interviewing healthcare providers working in the clinical setting to determine the feasibility and applicability of implementing The

SUPPER Project (a public health intervention for substance use prevention in adolescents) into clinical practice. I will articulate a rationale for bringing public health perspectives (implementing adolescent preventive substance use programs) through my communications with interviewees for the APE and through the data analysis and recommendations for the ILE. This process can emphasize to clinicians the benefits of implementing preventive programs or interventions like The SUPPER Project into clinical settings, on the basis that it can improve long-term health of their patients by addressing a large public health crisis (substance use disorder) before it begins. This can be demonstrated both through the results of the qualitative interviews and the recommendations that will be developed from them.

4. Competency 4 (APE - Foundational): Integrate perspectives from other sectors and/or professions to promote and advance population health.

   I will meet this competency by incorporating a diverse selection of healthcare providers including but not limited to physicians (primary care, family medicine, and pediatric specialists), advanced practice providers, nurses, and/or clinical psychologists for the key informant interviews to integrate multi-sectoral perspectives on the promotion of adolescent substance use prevention programs outlined in the scope of The SUPPER Project. This will be done through conducting the qualitative interviews, transcribing them, and developing a set of recommendations to inform the future of The SUPPER Project.

5. Competency 5 (APE+ILE - Concentration specific): Apply concepts and tools of population health to clinical practice in diverse health care settings.

   I will demonstrate attaining this competency by investigating through interviews and their analysis how concepts and tools of population health in using adolescent-tailored intervention programs to address substance use disorder prevention can be applied in clinical practice. The clinical practices chosen will encompass diversity in scope and populations served. Key informants will range from healthcare providers from major hospital affiliations to small community clinics and school-based health centers, which serve a diverse demographic of adolescents in terms of race, ethnicity, socioeconomic status, and background.