



OPEN A nurse-led satellite clinic initiative for STI testing in an Australian correctional center: a qualitative study

Amanda Balmer^{1,9}, Annette Brömdal²✉, Amy B. Mullens³, Kathryn Kynoch^{4,5,6}, Sonya Osborne¹ & Leah East^{1,7,8}

This exploratory study aimed to identify barriers and facilitators of a nurse-led satellite pilot clinic to improve sexually transmitted infection (STI) testing, treatment, and prevention in an Australian male correctional center. A descriptive qualitative research design was utilized to inform program evaluation. Qualitative data were collected from nurses via semi-structured interviews, and from incarcerated participants who attended the satellite clinic through open-ended satisfaction survey responses. Data were analyzed using deductive thematic analysis guided by the consolidated framework for implementation research (CFIR). Six major themes, aligned with the five CFIR domains were developed: (1) Meeting the needs of incarcerated people (outer setting domain); (2) Adaption based on needs; (implementation process domain); (3) Nursing staff motivation (individuals domain); (4) Incarcerated population's desire to be healthy (individuals domain); (5) Shared vision (inner setting domain); and (6) Efficacy of clinics due to the satellite method (innovation domain). Barriers and facilitators raised by the two participant groups in this study identified a range of key recommendations: (1) Additional sexual health education; (2) Hiring appropriately skilled clinical nurses; (3) Collaborating with policy makers; (4) Continuing intra-organizational cooperation and adaptability; and (5) Additional days, advertising and modes of delivery. These recommendations highlight the requirement for these clinics to meet the needs of the incarcerated population.

Keywords Sexually transmitted infections, Sexually transmitted diseases, Prison, Sexual health, Vulnerable population, Australia

Sexually transmitted infections (STIs; such as gonorrhea, syphilis and chlamydia) continue to be a major global issue with over one million STIs diagnosed daily¹. Incarcerated people are at a higher risk of acquiring communicable diseases such as STIs compared to people living in the general community². It is well-established that sexual risk behaviors such as unprotected sex in carceral settings, increases the risk of STI acquisition, including blood borne viruses such as hepatitis and HIV^{3,4}. Similarly, there are multiple barriers impacting the likelihood of incarcerated populations engaging with health services, including low levels of health literacy, limited facility infrastructure⁵ and hinderances associated with carceral environments such as lockdowns limiting an individual's ability to seeking medical services⁶. Thus, people residing in carceral settings may experience limited access to sexual healthcare⁷. In addition to enhancing access to a population who is often underserved regarding holistic and essential healthcare, a nurse-led sexual health clinics can improve STI testing, treatment, and prevention. Critically, it has the potential to help mitigate the risk and transmission of STIs within correctional settings⁸.

¹School of Nursing and Midwifery, University of Southern Queensland, Toowoomba, QLD, Australia. ²School of Education, University of Southern Queensland, 487-535 West St, Darling Heights, Toowoomba, QLD 4350, Australia. ³School of Psychology and Wellbeing, University of Southern Queensland, Ipswich, QLD, Australia. ⁴Mater Health, Brisbane, QLD, Australia. ⁵Queensland Centre for Evidence Based Nursing and Midwifery: A Joanna Briggs Institute Centre of Excellence, Brisbane, QLD, Australia. ⁶School of Nursing and Midwifery, Queensland University of Technology, Brisbane, QLD, Australia. ⁷Centre of Health Research, University of Southern Queensland, Toowoomba, QLD, Australia. ⁸School of Health, University of New England, Armidale, NSW 2350, Australia. ⁹Woodford Correctional Centre, 1 Neurum Rd, Woodford, QLD, Australia. ✉email: annette.bromdal@usq.edu.au

Background

STIs are viral, bacterial and parasitic infections that are spread through sexual contact, bodily fluids and skin-to-skin contact⁹. Some STIs are also transmitted through childbirth¹⁰. The World Health Organization (WHO) highlights that incarcerated people are a vulnerable population and at a higher risk of acquiring STIs than the general population⁷. Consequently WHO has provided recommendations to improve sexual healthcare provision for incarcerated populations inclusive of health interventions focused on the prevention of HIV, viral hepatitis, and STIs⁷. In Australia, it is well-established that incarcerated people are a vulnerable group and at particular risk of STI acquisition, yet they lack access to education and risk mitigation strategies within the custodial setting^{11,12}.

Parallel to this, nurses have a unique opportunity to contribute to improved health outcomes through sexual healthcare provision¹³. Research suggest nurses have an important role in delivering patient-centered holistic healthcare and are well-positioned to reduce STI prevalence within the general population¹⁴. Horwood et al. conducted a nurse-led telephone-based service to manage chlamydia and gonorrhea infections diagnosed in the general community¹⁵. The study utilized 'specialist' nurses to run the nurse-led intervention, and was considered as acceptable and feasible by both healthcare providers and patients¹⁵. Within the general community, nurse-led clinics have been reported to improve access and uptake of sexual health services¹⁶. With STIs placing a significant financial burden on healthcare globally¹⁷, nurse-led clinics have also shown to be an affordable means of delivering quality healthcare with a particular impact on vulnerable and high-risk populations¹⁸. Similarly, nurse-led STI prevention programs have been successful in improving sexual health outcomes for vulnerable and at risk populations, such as incarcerated people^{8,19,20}.

Taking the aforementioned factors into consideration, a nurse-led satellite clinic initiative for regular STI testing (hereon satellite STI clinic) was conducted in a male correctional center in Queensland, Australia. Drawing on two distinct cohorts, this descriptive qualitative study was conducted to identify the barriers and facilitators of the satellite STI clinic, and to inform clinic evaluation for scalability for: (1) incarcerated people attending the clinic; and (2) nursing staff involved in the implementation of the clinic.

The study

Aims and objectives

The aim of this exploratory research was to investigate the barriers and facilitators of implementing a nurse-led satellite STI clinic to improve STI testing, treatment, and prevention among a population of incarcerated people in a male correctional center in Queensland, Australia to inform clinic evaluation and potential scalability.

Methods

Study design

A descriptive qualitative research design was used to undertake this study. Drawing on the perspectives of incarcerated people attending and clinic nurses delivering the satellite STI clinic respectively, a deductive thematic analysis was used guided by the Consolidated Framework for Implementation Research (CFIR) to explore the barriers and facilitators to implementing the satellite STI clinic in the corrections environment.

The satellite STI testing clinic

Prior to implementing the satellite STI clinic, incarcerated people were required to complete a request form to access health services, including sexual health services. Once assessed and triaged by a healthcare professional, the individual was placed on a waitlist to receive an appointment with relevant healthcare personnel. The time period between a health service request and an appointment varied, and could be delayed due to lockdowns, and triage level (acute–non-acute). Post appointment, delays in care could be attributed to off-site pathology and courier requirements. The implemented satellite STI clinic sought to overcome these issues by providing a total of 26 satellite clinic days (one per week) for a 6-month period. A single clinic nurse travelled to a secure location managed by the carceral facility to provide the satellite STI clinics, and maintained patient nurse confidentiality. Clinics provided STI testing for common STIs including chlamydia, gonorrhoea, trichomoniasis, and syphilis, as well as for BBVs that can be sexually transmitted including HIV, hepatitis C, and hepatitis B through pathology testing. Screening, prevalence, and treatment rates pertaining to the satellite STI clinic are reported elsewhere (currently under review) and participant numbers are reported below.

Participants attending the clinic were given one-on-one sexual health education based on responses provided in the sexual health history, and individual needs. In the event of a positive STI result, treatment and follow up testing were undertaken, and contact tracing if required.

Theoretical framework

The CFIR framework is a determinants framework used to consider barriers and facilitators informing an implementation approach^{21,22}. For this study, we selected the updated CFIR framework, as it is the most up-to-date version of a commonly used determinants framework utilized in health service evaluations²². We modified Lam et al.'s CFIR semi-structured interview guide to suit the research environment with the inclusion of the satellite STI testing clinic (a pivotal component regarding the structure and design of this study)²³. Table 1 provides an overview of the adaptation to Lam et al.'s CFIR guided semi-structured interview guide²³. The CFIR framework was also selected for its ability to facilitate the translation of research into practice by considering: (1) what interventions have worked; (2) where they worked; and (3) why they worked, to collectively assess if and how the intervention was effective, sustainable, and to aid in dissemination²¹. The CFIR framework considers the constructs for effective implementation based on user feedback through five domains: (1) outer setting; (2) implementation process; (3) individuals; (4) inner setting; and (5) innovation. Within these five domains, there

| CFIR domain (parent code) | CFIR categories and sub-categories (child code) | Cohort | Questions Adaption on Lam et al.'s ²³ semi-structured interview questions (CFIR-guided) and satisfaction survey questions |
|---------------------------|---|-------------------------|--|
| Outer setting | Local conditions | Satellite clinic nurses | How well does the STI satellite clinic program meet the needs of your patients? In what ways? In your clinic, has there been a strong need to increase STI testing rates? Why or why not? |
| | Financing | Incarcerated people | Barriers: 'What could we do to improve?' Facilitators: 'What did you find good about the clinic?' |
| Implementation process | Adapting | Satellite clinic nurses | How do the STI satellite clinics fit with the workflow in your medical unit? What kinds of information did you collect as you worked on improving your medical unit's STI testing rate? How was that information used? |
| | Reflecting and evaluating | Incarcerated people | Barriers: 'What could we do to improve?' Facilitators: 'What did you find good about the clinic?' |
| Individuals | Implementation team members Mid-level leaders Innovation recipients Motivation | Satellite clinic nurses | What has been your motivation for wanting to help ensure the implementation is successful? How confident are you about being able to use the work unit guideline (WUG) to deliver the STI satellite clinics regularly in your medical unit? How confident are your colleagues? How motivated are you to use the WUG to deliver STI satellite clinics regularly in your medical unit? How motivated are your colleagues? |
| | Characteristics subdomain Need | Incarcerated people | Barriers: 'What could we do to improve?' Facilitators: 'What did you find good about the clinic?' |
| Inner setting | Culture Human equality centeredness Recipient centeredness Mission alignment | Satellite clinic nurses | What supports were available to help you to adopt the STI satellite clinic? In your medical unit, what kinds of incentives are there for making the implementation of an STI satellite clinic successful? How do you think your medical unit's culture affects the implementation of these STI satellite clinics? |
| | Tension for change | Incarcerated people | Barriers: 'What could we do to improve?' Facilitators: 'What did you find good about the clinic?' |
| Innovation | Innovation adaptability Innovation relative advantage | Satellite clinic nurses | How does the STI satellite clinic program compare with other existing programs in your medical unit? What advantages does this STI satellite clinic program have? What disadvantages does this STI satellite clinic Program have? What kind of changes did you have to make to the STI satellite clinic so it would work in your medical unit? How complicated were the STI satellite clinics? How well has the STI satellite clinic been received in your medical unit? Will the STI satellite clinic continue after the funded implementation is complete? Why or why not? |
| | Innovation adaptability | Incarcerated people | Barriers: 'What could we do to improve?' Facilitators: 'What did you find good about the clinic?' |

Table 1. Adaption of Lam et al.'s²³ CFIR guided semi-structured questionnaire, and satisfaction survey questions as applied to the CFIR framework.

are underlying constructs and sub-constructs; each used to consider what has worked, where, and why²² (see Fig. 1).

Study setting and recruitment

This single-site study was undertaken in a closed high security correctional center in Queensland, Australia. The correctional center had a maximum capacity of 1550 people, including men and a few transgender women, all aged 18 years and over. There was a total of five satellite clinic nurses who were identified for recruitment. A recruitment email was distributed by the Deputy Director of Research for the hospital and health service to create a degree of separation between the researchers and the potential participants. The email contained information about the research along with contact details for a member of the research team to discuss any questions and/or to organize participant information sheets and consent forms prior to taking part in the project.

Incarcerated people residing in the correctional center were eligible to voluntarily participate in the satellite STI testing clinics held between December 2022 and June 2023. Prior to the commencement of the clinics, a verbal presentation was provided by the clinic nurse in each of the prison's accommodation areas. This presentation provided a comprehensive explanation of the clinic's program and overall aim. The presentations also advised when the program would commence, how long the clinics and the program would run, what the clinic consultation would entail, the procedure to be taken if a patient received a positive diagnosis, where and when the clinics would be held, and how to participate in the satellite STI clinic program (self-nomination were offered).

Data collection

Clinical nursing staff

Qualitative data were collected and analyzed from satellite STI clinic nurses via semi-structured interviews, lasting up to 30 min in duration. These Interviews were conducted in March and April 2024. Participant information sheets and consent forms were provided to potential satellite STI clinic nursing participants to read, ask questions and sign prior to the interviews. One member of the research team (A.M.), who had no previous contact with the satellite STI clinic nurse participants, carried out data collection via one-on-one semi-structured interviews. These interviews were audio recorded with automatic transcription and then deidentified prior to the lead researcher engaging in data synthesis. Due to participants potentially being known to two of the researchers (A.B. and A.Br.), potential participants were requested not to discuss their recruitment and/or participation in the study with the other parties. Four out of the five clinic nurses participated in the study—this

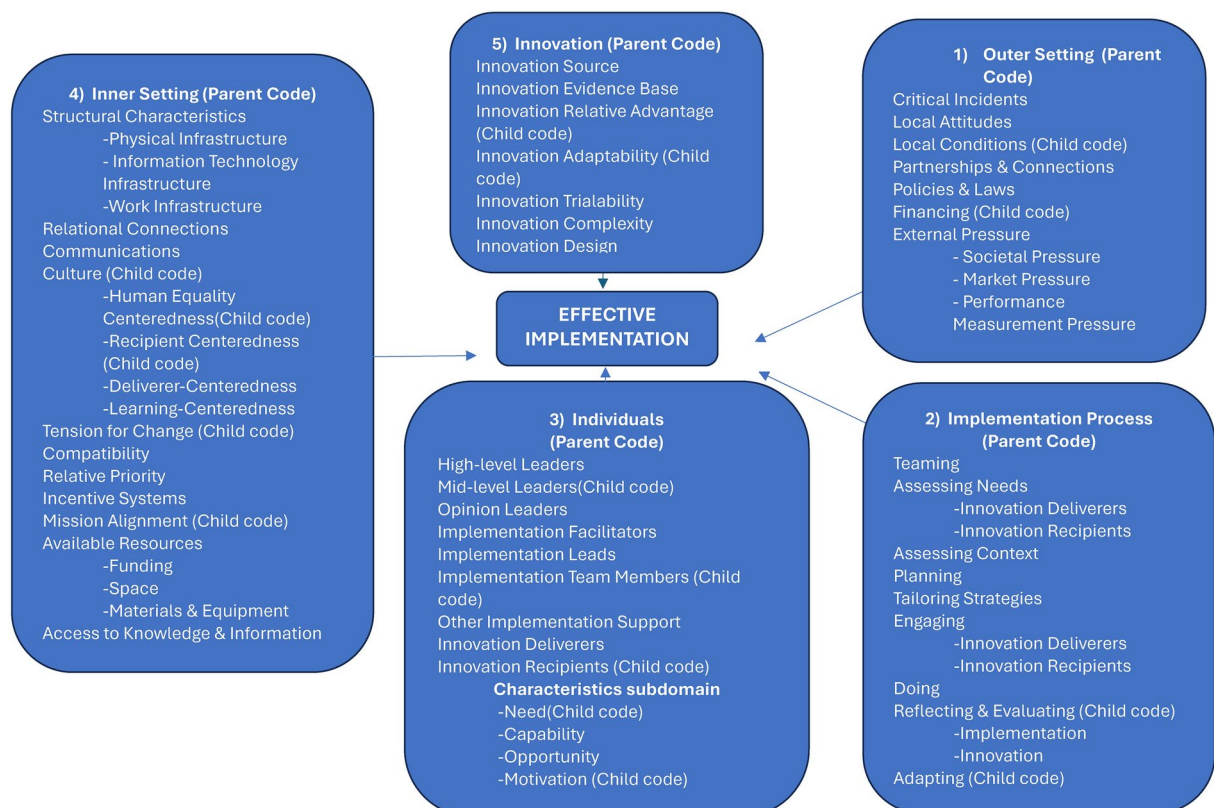


Fig. 1. Damschroder et al.'s²², updated CFIR framework as it applies to coding.

represented 80% of this cohort, and was deemed satisfactory by the author team. This sentiment also aligns with Saunders et al. suggesting a study sample is large enough to reach theoretical saturation when it satisfies the study's research question, theoretical lens, and analytical framework²⁴.

Incarcerated people

Qualitative data were collected and analyzed from incarcerated people who participated in the satellite STI testing clinic (collected from week five onwards) and provided satisfaction survey responses to the two open-ended questions (2 min in duration). Qualitative responses were provided in 191 clinic sessions. Out of these sessions, 181 incarcerated people participated in the satisfaction survey with nine participants attending the clinics twice, and one participant providing no response. A.B. and A.Br. conducted a medical chart audit to extract these responses which occurred between October 2023 and March 2024, and ensured all data were de-identified and anonymized, to maintain participant confidentiality.

As this is exploratory research, two open-ended questions were asked: 'What did you find good about the clinic?' and 'What could we do to improve?' These questions were adapted from an inpatient survey conducted by the National Health Service (NHS) Care Quality Commission where the qualitative survey questions were used to consider inpatient experiences in an NHS hospital²⁵. The responses to the question 'What could we do to improve?' were used to identify barriers to the implementation of the satellite STI testing clinic, and the responses to 'What did you find good about the clinic?' were used to consider facilitators. Due to limitations relating to literacy, and multilingual diversity, the clinic nurse administered the satisfaction survey verbally, documenting responses verbatim.

Data analysis

Qualitative data from the semi-structured interviews and the open-ended satisfaction survey questions were analyzed as separate data sets. One researcher with in-depth understanding of the research environment (A.B) completed the coding to ensure all implied and inferred meanings were captured. The authors then utilized the five CFIR domains, constructs and sub-constructs as codes which were then used to consider the responses to both data sets (see Table 1). Member checking was also completed with the satellite STI clinic nurses with no changes being required to the interview transcripts. All coding was completed using NVIVO software where 'parent' and 'child' codes were assigned. Confirmability of data analysis and synthesis were completed through multiple group discussions amongst all co-authors with perspectives and experiences of researchers from different disciplinary backgrounds including differing intersecting identities concerning gender, sexuality, and cultural and linguistic backgrounds.

Ethical considerations

The study, with its two data collection methods, was approved by the Townsville Institute of Health Research and Innovation (TIHRI) HREC/2023/QTHS/97545, and the University of Southern Queensland Human Research Ethics Committee ETH2024-0346.

Informed consent was gained from all clinic nurses participating in the study. Due to the incarcerated population being transient in nature, open-ended satisfaction survey questions (part of the archival medical charts) became the method to collect the voice of the incarcerated population. As these open-ended satisfaction survey questions were documented in patient charts, approval to waiver informed consent was gained from the Public Health Act (PHA; PHA 97545) allowing access to medical charts to retrieve the satisfaction responses from incarcerated individuals. This was also in line with the Australian National Statement on Ethical Conduct in Human Research (2007)—updated 2018, and in line with the 1964 Declaration of Helsinki and its later amendments. All methods were carried out in alignment with these ethical standards, guidelines and regulations, including de-identification and anonymization of all data from both cohorts.

Findings and discussion

Table 2 presents the six major themes that were developed from the data which are represented in each of the five CFIR domains including: (1) Meeting the needs of incarcerated people (outer setting domain); (2) Adaption based on needs; (implementation process domain); (3) Nursing staff motivation (individuals domain); (4) Incarcerated population's desire to be healthy (individuals domain); (5) Shared vision (inner setting domain); and (6) Efficacy of clinics due to the satellite method (innovation domain). The barriers and facilitators for each cohort group are presented too.

In four of the five CFIR domains, the incarcerated population and the satellite STI clinic nurses' responses aligned to develop one single theme within the domain. However, this was not the case with the 'Individuals domain', where two separate themes were developed for each cohort with 'Nursing staff motivation' as the theme for satellite STI clinic nurses, and 'The incarcerated population's desire to be healthy' as the theme for incarcerated people.

Outer setting domain

Meeting the needs of incarcerated people

The overarching theme developed in the outer setting domain was 'Meeting the needs of incarcerated people'. The corresponding construct for the nurses was associated with 'Local conditions', and for the incarcerated population the construct was associated with 'Financing'.

Construct: local conditions This construct related to environmental conditions that affected the implementation of the satellite STI clinics²² and was shown in the barriers identified by the satellite clinic nurses (see Table 2). Previous research has identified that environmental conditions play a significant role in the implementation of interventions in healthcare settings^{26,27}. Within this construct, *facilitators for satellite STI clinic nurses* included 'Responding to what incarcerated people want and need' which was evidenced through the multiple accounts of how the clinics were meeting the needs of the facility's incarcerated people (see Table 2). *Barriers for satellite STI clinic nurses* within the environment included factors that reduced the level of sexual health for incarcerated people due to limited access to sexual health services. Also, a low level of literacy and health knowledge within the environment, and the significant impact syphilis had within the State of Queensland, and within corrections were further barriers within this construct (see Table 2). This in turn affected the incarcerated people's ability to maintain an adequate level of sexual health and wellbeing.

Construct: financing The funding provided to pilot the satellite STI testing clinic included sexual health education, and has had a positive uptake. Similarly, participants in this study expressed satisfaction with the sexual health education provided which is in alignment with WHO recommendations suggesting that sexual health education is needed among vulnerable and at risk key populations, such as incarcerated populations²⁸ (see Table 2). Insufficient funding was identified as an influential *barrier to innovation* within the nursing field²⁹. *Facilitators for incarcerated people* included 'Positive uptake and satisfaction with the sexual health education provided in the clinics'. The satisfaction survey responses stressed that the sexual health education that was provided was not only positively received but was also meeting the health needs of the incarcerated participants (see Table 2). This facilitator, under the financing construct was also seen as a *barrier for incarcerated people* which included 'education funding', where incarcerated people wanted more sexual health education than the currently provided funding scheme provided (see Table 2). This indicates that incarcerated people are aware of their lack of sexual health literacy, and they want and need more sexual health education to improve their overall health while serving their time.

Implementation process domain

Adaption based on needs

As explored below, the overarching theme identified in the implementation process domain was 'Adaption based on need' and the construct was associated with 'Adapting' for satellite STI clinic nurses, while the construct was associated with 'Reflecting and evaluating' for incarcerated people.

Construct: adapting The construct of adapting involved modifying the intervention to align with the workplace for optimal integration²². This aligns with Wiltsey et al.'s expanded framework for reporting adaption and modification to evidence-based interventions (FRAME) which is used to characterize modifications to new evidence based practice (EBP) implementation in healthcare³⁰. Wiltsey et al. highlight that adaptations made to

| CFIR domain | Main theme/s | Sub-themes | Barriers and facilitators | Qualitative examples by cohort | Participant number |
|------------------------|---|---|---------------------------|---|--------------------|
| Outer setting | Meeting the needs of incarcerated people | Satellite clinic nurses | | | |
| | | Factors reducing the level of sexual health | Barriers | “there’s a syphilis outbreak in Queensland... We can’t get on top of it.... from our... experience...doing the testing in the last year... we’ve found a number of people who have had syphilis for quite some time and not known... they could have been passing it on to anybody... It’s important to get on top of that.” | Participant 1 |
| | | Responding to what the incarcerated people want and need | Facilitators | “...a lot of the feedback [from incarcerated people] comes back is great education, good to talk to nurses that are helpful. So we’re not there to judge on the day we’re there to basically find an issue and fix the issue and give them education where they needed education.” | Participant 3 |
| | | Incarcerated people | | | |
| | | Education funding | Barriers | “More information required. Inmates don’t know,” and “More education,” “A health workshop,” “Health promotion packs., and “education on PreP” | N = 11 |
| | | Positive uptake and satisfaction with the education provided in the clinics | Facilitators | “Helpful, good, great education,” “education,” “good information,” “good education,” and “educational.” | N = 14 |
| Implementation process | Adaption based on needs | Satellite clinic nurses | | | |
| | | Inadequate space to provide medical care needed | Barriers | “removing that body of work [Satellite STI testing clinic] from the medical centre makes it [STI testing] much easier. ‘Cause we don’t fighting for space.” This statement relates to the current need for medical staff to compete for this space in order to deliver medical care to patients | Participant 1 |
| | | Adaptability of program | Facilitators | “Well, what we learned was... the inmates ... gave us a lot of insight into what is going on in the units where ... they call home. So we were able to use this to our advantage...they were telling us what lifestyle choices ...they were making as in sharing needles, tattoo guns, hiding things, [under] their foreskin. We were able to then get information on how to reduce [i] nfections and stuff like that educate the inmates...” | Participant 2 |
| | | Incarcerated people | | | |
| | | No improvement needed | Barriers | “Nothing,” “All good,” or “Nil”; “More confidentiality, NO QCS Officer” | N = 11 |
| | | Satisfaction with clinic nurses | Facilitators | “Easy to talk to, more personal, better to talk with a male nurse”, “Easy to talk to,” “Open, easy talk to[sic]”, “Friendly people, easy to talk to, “All good. Great having a male nurse to talk to.” and “Easy to talk to, no stress.” | N = 17 |
| Individuals | Nursing staff motivation | Satellite clinic nurses | | | |
| | | Getting WUG approved | Barriers | “...It’s [gaining approval for the WUG] been ... a really hard slog, especially getting the work unit guidelines for it [the satellite STI testing clinic] as well. It’s been difficult.” | Participant 2 |
| | | Incarcerated people potentially being at risk of impacting the sexual health of the community | | “They [incarcerated people] do contribute to infection rates in the community... For me, professionally, it’s a programme that I want to see succeed because if we can make a difference to a person’s health whilst incarcerate...that will obviously have a positive impact in the Community and hopefully help with decreasing infection rates within the Community.” | Participant 4 |
| | | Positive outcomes as a result of motivated staff | Facilitators | “Well, I’ve always... had an interest in...sexual health, but I’ve never really done anything about it... [T]hey [incarcerated people] ... felt like they had no one to turn to... I just thought ...what a horrible thing to have hanging over your head. Knowing that... could have possibly contracted disease... and you can’t go to anybody...It’s, you know, it’s embarrassment. It’s ... always looked down upon....[w]here now we’ve changed that. ...Well, it’s made a huge change.” | Participant 2 |
| | | Nursing staff confidence in applying the WUG | | “I’ve been doing this a long time, so I probably was pretty confident in delivering the clinic anyway, but I think for people and we have supported new people into the team who’ve never done it before and that basically that was what we said to them. Here’s the work unit guideline. If you follow that, you can’t go wrong and that’s what people have used because it is a sort of sole practitioner kind of space you’ve not got. Anyone handy that you can ask questions on? So it’s been really useful.” | Participant 1 |
| | Incarcerated populations desire to be healthy | Incarcerated people | | | |
| | | Prophylactic programs to reduce transmission | Barriers | “Condoms. Prevention is better than cure,” “Bleach packets needle exchange- Minimising risk.”, and “Provide new tattoo needles = Prevent spread of diseases.” | N = 30 |
| | | Desire to be healthy and wanting to get tested | Facilitators | “Full health check, get out of jail knowing your clean,” “Very good to get regular. Knowing that you can get tested regularly,” “To stay safer,” “Keeps the jail clean, better health all round,” “Makes us all healthier,” and “Takes too long to get to medical, health is all we’ve got.” | N = 38 |
| | Continued | | | | |

| CFIR domain | Main theme/s | Sub-themes | Barriers and facilitators | Qualitative examples by cohort | Participant number |
|---------------|---|--|---------------------------|---|--------------------|
| Inner Setting | Shared vision | Satellite clinic nurses | | | |
| | | Skepticism and resistance to change | Barriers | "I mean it [implementing the satellite clinics] sounds simple... that people shared a vision. There's always a few sceptics or ... people who aren't followers to ...change...[C]ulture plays a significant role in ensuring the success of a new program... so...that programme... [w]as successful, I think because overall the culture was accepting that it was... needed." | Participant 4 |
| | | Multi-level interorganizational support | Facilitators | "we had executive support [Hospital and health service]... then at a local XX Medical Centre level, we had local medical officer and nurse practitioner support... QC[S] certainly provided support at a local level. Because they knew... we could provide more health services to... the prisoner group that they in turn could get a safer prison... And then...financial support and ensuring that we were able to maintain a normal roster with our nursing team..." | Participant 4 |
| | | Incarcerated people | | | |
| | | Lack of advertising, concern clinics would discontinue and wanting services in other jails | Barriers | "This should continue for the health of the inmates."; "Advertising"; "do other jails." | N = 16 |
| | | Satisfaction with clinics | Facilitators | "More comfortable, no stigma around drugs, STIs," "Helpful, good," "Good job", "Great", and "Good that you are running this clinic." | N = 20 |
| Innovation | Efficacy of clinics due to the Satellite method | Satellite clinic nurses | | | |
| | | Stigma | Barriers | "Some people don't feel comfortable in that environment going, hey... I'd like to, you know, have a sexual health screen. They would rather the anonymity of just coming to medical... So what ...can be seen as it's really big strength can also be depending on the person can be a downside..." | Participant 1 |
| | | Improved uptake and improved health outcomes | Facilitators | "the feedback we get back from them is that ... they don't have to go out of their way to come to us, we're going to them and .. yeah, that's been working really good." | Participant 3 |
| | | Incarcerated people | | | |
| | | Not enough days a week | Barriers | "More days for sexual health testing," "More days a week," "Regular check, come to the units more often," and "More of it/more days." | N = 28 |
| | | Convenience-satellite clinics | Facilitators | "Don't have to go to medical. We can never get down there," "Coming to the units," "No wait. You come to us," and "It's good that you come to the units." | N = 24 |

Table 2. Quotes as applied to themes, sub-themes, and barriers and facilitators from semi-structured interviews with satellite clinic nurses, and satisfaction survey responses from incarcerated people.

a new implementation in healthcare should be context-specific, and meet the needs of the target population to ensure optimal engagement, acceptance, and health outcomes³⁰. The satellite STI clinic program's adaptability was identified as both a *barrier and a facilitator for the satellite STI clinic nurses* to meet the needs of the incarcerated people. This was evident in both the design of this program (satellite methods to overcome inadequate space and to increase healthcare access to a priority healthcare need), and with the adaptations made to the sexual health education, catering specifically for incarcerated people (sexual health education based on current risk activities in the prison) (see Table 2). The satellite STI clinic nurses' recollections suggested that the sexual health education provided to incarcerated people was quite distinct from the sexual health education provided in the general community (see Table 2). Thus, adaptations taking into account the needs of this vulnerable and at risk cohort are imperative, due to incarcerated populations' disproportionately higher rates contracting STIs than the non-incarcerated population⁷. Similarly, the comments made by the satellite STI clinic nurses concerning inadequate space to conduct clinics, suggests that health service expansion is achievable by delivering the clinics through the satellite method (see Table 2).

Construct: reflecting and evaluating The 'Reflecting and evaluating' construct was used to reflect on the success of the implementation of the satellite STI clinic drawing on two sets of qualitative data²². Based on responses to the open-ended satisfaction survey question, the 'Reflecting and evaluating' construct was a *facilitator for incarcerated people*. Here, incarcerated people expressed a high level of satisfaction with the nursing staff who delivered the clinics, including, to a large degree, responding 'nothing' or 'nil' to the satisfaction survey question 'What could we do to improve?' (see Table 2). This satisfaction survey question was designed to identify the *barriers of incarcerated people* however, the adaptations made to the satellite clinics had an overwhelming positive response.

Individuals domain
Incarcerated population's desire to be healthy
Two overarching themes developed in the individuals domain were 'Incarcerated population's desire to be healthy', and 'Nursing staff motivation'.
The theme 'Incarcerated population's desire to be healthy' and the sub-domain construct was associated with the 'Need' for incarcerated people. The theme identified in the individuals domain for satellite STI clinics nurses was 'Nursing staff motivation' and the constructs and sub-constructs were associated with 'Mid-level leaders' construct, and the 'Innovation recipients' construct, with a sub-construct of 'Motivation' for satellite STI clinic nurses.

Construct: innovation recipients This construct and its sub-construct of ‘Need’ refer to the participants who were directly affected by the satellite STI clinic, and how the participant’s wellbeing was affected by the clinic’s implementation²². Additionally, satisfaction survey responses from the incarcerated population reflected their ‘desire to be healthy and wanting to get tested’ as a *facilitator*, including the awareness that testing for STIs is a means to do so (see Table 2). These responses also highlighted the *barriers for incarcerated people* suggesting the need for additional interventions to support their rights to ‘the enjoyment of the highest attainable standard of physical and mental health’ while serving their sentence, as outlined by International Covenant on Economic, Social and Cultural Rights of which Australia is a signatory³¹. Multiple studies on STI prevention interventions have been conducted in other jurisdictions in Australia, such as Dolan et al.’s study on a condom distribution program in New South Wales (NSW)³², Scott et al.’s condom distribution program with paired opt-out STI in Victoria (VIC)³³, and Yap et al.’s study on dental dam use in NSW³⁴. However, correctional centers in Queensland, Australia have yet to embrace any of these evidence-based primary interventions to protect people from contracting STIs in prison³⁵, including the general population once incarcerated people have served their time.

Nursing staff motivation

Construct: implementation team members Within this domain, the construct of ‘Implementation team members’ refers to the satellite STI clinic nurses directly involved in implementing the satellite clinic intervention²². A *facilitator for satellite clinic nurses* included positive outcomes as a result of motivated staff. This facilitator resulted in positive change for the incarcerated population due to nurses passionate about sexual health, driven to invoke change, and had a desire to improve the overall health of incarcerated people (see Table 2).

Construct: mid-level leaders The ‘Mid-level leaders’ construct refers to those with a medium level of authority within the organization, and their influence on the implementation²² of the satellite STI clinic. The ‘Innovation recipient’ construct with a sub-construct of ‘Motivation’ refers to the people directly involved in the implementation of the satellite clinic, and their motivation to achieve their goal²². The ‘Mid-level leaders’ construct was a *barrier for satellite clinic nurses* as it involved obtaining work unit guideline (WUG) approval for implementing the satellite STI clinic (see Table 2). The required approval, and the bureaucratic nature of healthcare facilities, including wider organizational structures can hinder for interventions to be implemented in a timely manner.

Construct: innovation recipients Another *barrier for satellite STI clinic nurses* involved incarcerated people being at risk of impacting the sexual health of the general community. This barrier came under the ‘Innovation recipients’ construct, with a sub-construct of ‘Motivation’ as the satellite STI clinic nurses were motivated by their concern for the health of both incarcerated people and the general community outside the carceral setting (see Table 2). More specifically, as high rates of STIs in carceral settings are transmitted by incarcerated people moving in and out of the custodial setting this is a significant transmission concern affecting the general population³⁶. The ‘Motivation’ sub-construct also applied as a *facilitator for satellite STI clinic nurses* with multiple accounts from expressing feelings of confidence in applying the WUG, and positive outcomes because of motivated staff (see Table 2).

Inner setting domain

Shared vision

The overarching theme identified in the inner setting domain was ‘Shared vision’ and the construct and sub-constructs were associated with ‘Culture’, ‘Human equality centeredness’, ‘Recipient centeredness’, and ‘Mission alignment’ for satellite STI clinic nurses. The construct for incarcerated participants was ‘Tension for change’.

Construct: mission alignment The ‘Mission Alignment’ construct refers to the overall commitment of those within the inner setting to achieving the goal of implementing the satellite STI clinic intervention²². This construct applied to the *barriers for satellite STI clinic nurses* including skepticism, and resistance to change among other health staff within the carceral system and setting (see Table 2). Organizational culture plays a critical role regarding the success of a new implementation²⁶ such as the one explored in this paper.

Construct: tension for change The ‘Tension for change’ construct relates to the immediate need for change as a result of unacceptable conditions²². Within this construct, *barriers for incarcerated people* included a lack of advertising, a concern the satellite STI clinic program could discontinue, and the lack of services in other incarcerated settings (see Table 2). This construct also acted as a *facilitator for incarcerated people* who were very satisfied with how accessible the sexual health services became after the immediate and implemented changes to the STI testing procedure, compared with the previous and time consuming method of accessing the carceral setting’s sexual health services (see Table 2).

Construct: culture *Facilitators for satellite STI clinic nurses* included the multilevel interorganizational support, and were identified within the ‘Culture’ construct, which included sub-constructs of ‘Human equality centeredness, and Recipient centeredness’²². These constructs and sub-constructs apply to the common ideals, values, and beliefs shared by all stakeholders involved in implementing the satellite STI clinic intervention. The stakeholders had a shared goal to support the incarcerated populations’ welfare rooted in equality and optimal health. Aside from the perceived delays regarding the satellite STI clinic implementation approval process, the satellite clinic nurses’ expressed an overwhelming support from diverse stakeholders, including health services, and Queensland Corrective Services (QCS) (see Table 2). Previous research on the implementation of EBP found that nurse managers played a significant role in the successful adoption of an EBP intervention³⁷. Similar-

ly, a study by Urquhart et al.³⁸ reported that buy-in and support from program leaders at multiple levels within a clinical department, played a significant role in the successful implementation of the intervention.

Innovation domain

Efficacy of clinics due to satellite method

The overarching theme identified in the innovation domain was 'Efficacy of clinics due to the satellite method' and the construct and sub-constructs were associated with 'Adaptability' and 'Relative advantage' for satellite STI clinic nurses. The constructs and sub-constructs for incarcerated participants were associated with 'Adaptability'.

Construct: adaptability The 'Adaptability' construct was applied to the barriers identified by both the satellite STI clinic nurses and the incarcerated people. *Barriers for the incarcerated people* were connected to 'Not enough days a week' for STI testing, while the *barriers for the satellite clinic nurses*, related to possible stigma associated with STI testing within the corrections environment negatively affecting incarcerated people. The 'Adaptability' construct relates to the ability of an innovation to be modified and changed within the environment to meet the needs of the recipients²². This construct was applied to these barriers to make recommendations. *Facilitators for incarcerated people* also came under the 'Adaptability' construct which highlighted how the adaptations made to the clinics through the satellite method had a positive outcome. This included the adaptations made to fit the clinic within the carceral environment and meeting the incarcerated people in their accommodations, as opposed to incarcerated people making STI testing appointments and possibly waiting for months before accessing a medical consultation (see Table 2). Here, the incarcerated people noted the 'Convenience that the satellite clinics provided' as a *facilitator*. *Facilitators identified by the satellite STI clinic nurses* included 'Improved uptake and improved health outcomes' (see Table 2).

Construct: relative advantage *Facilitators for the satellite STI clinic nurses* came under the 'Relative advantage' construct referring to an implementation being more beneficial and suitable than the previous method²². In this instance, satellite STI clinic nurses noted an increased uptake of STI testing, and an improved health outcome by treating participants receiving a positive STI diagnosis more efficiently, and through sexual health education.

Recommendations

Outer setting domain

The overarching theme for the outer setting domain related to 'Meeting the needs of incarcerated people'. The needs identified by both incarcerated people and satellite STI clinic nurses highlighted that incarcerated people both want and need sexual health education. To meet this need and recommendation, additional funding is required by offering further STI testing through the week, coupled with sexual health education, with more staff engaged in the STI testing, treatment and prevention. Limited access to health services both within and outside the carceral setting was a barrier to incarcerated people receiving testing, treatment, and prevention through sexual health education. This issue is compounded with the low level of health literacy among the carceral population, including difficulties understanding health promotion messaging due to poor reading skills (see Table 2). A study by Tenibiaje et al. considered the literacy and health literacy levels among incarcerated adults in Nigerian prisons which were both found to be deficient within this cohort³⁹. This study highlighted the significant impact low levels of literacy have on health literacy which in turn has a detrimental effect on the health and wellbeing of incarcerated populations³⁹.

Satellite STI clinic nurses identified how taking the STI testing, and sexual health education to the incarcerated population in their accommodation setting, resulted in increased number of incarcerated people being tested, treated, and educated (see Table 2). This positive outcome was rooted in improved access. Findings from this study parallels with that of Pimenta et al.'s study focusing on opportunistic testing for chlamydia in both primary and secondary healthcare environments and the positive associations this may have⁴⁰. Although access to testing was not a factor in Pimenta et al.'s study, testing asymptomatic patients opportunistically no matter their initial reason for attending the healthcare facility, was found to be both acceptable, and a suitable method for upscale⁴⁰.

Recommendations

The need for additional funding and education related to sexual health for incarcerated people A key recommendation relates to the continued funding for the satellite STI clinic to maximize continued fruitful uptake, and for the upscale of the satellite STI clinics nation-wide. It is recommended that the additional funding be allocated to the improvement and expansion of the sexual health education component of this satellite STI clinic to better align with WHO's recommendations to provide comprehensive sexuality education, including STIs and HIV, and adequate health service interventions for vulnerable populations, such as incarcerated people¹.

Implementation process domain

The overarching theme for the implementation process domain was 'Adaption based on need'. This theme was strongly focused on listening to feedback, responding to the needs of incarcerated people and satellite STI clinical nurses, and adapting the process if required. Whilst one incarcerated participant requested 'More confidentiality, NO prison Corrections Officer' (see Table 2) this is an inactionable request as nursing staff are, due to safety precautions, required to be accompanied by prison officers when conducting clinics.

Similarly, to the authors' knowledge, satellite clinics providing mobile medical care within carceral settings is an under-researched area. However, studies involving mobile STI testing clinics within the community have, similar to the current study, had positive outcomes in relation to improving testing and treatment for the targeted population⁴¹. For example, a study by Heese et al. focused on mobile STI testing within the community found that taking STI testing to/near to populations vulnerable to contracting STIs, improved accessibility and

uptake⁴¹. As such and for future upscale, the authors of this article recommend the STI clinics remain satellite to reduce the burden on medical centers, to improve workflow, and importantly, increase access and uptake to STI testing, treatment and prevention through sexual health education. Parallel to this, both incarcerated people and satellite STI clinic nurses highlighted that high risk STI-inducing behaviors were undertaken in the carceral setting (see Table 2), offering valuable insights into how and why some STIs are spreading in real time. This information would further enhance the sexual health education to be adapted to be further relevant and meet the needs of the incarcerated population.

Recommendations

Having appropriately skilled nursing staff running the clinics Future staffing considerations should include nurses who are approachable, non-judgmental, knowledgeable, and capable of building therapeutic working relationships with incarcerated people. Whilst the lead author intends to upscale the satellite STI testing program with the sexual health team currently in place, the inclusion of an increased staffing pool to implement the clinic at each center during upscale is imperative for its success. Open-ended satisfaction survey responses need to be monitored to ensure incarcerated people's high satisfaction with the nurses delivering the satellite STI clinic continues.

Individuals domain

The overarching theme for the Individuals domain was 'Nursing staff motivation', and the 'Incarcerated population's desire to be healthy'. One barrier relating to gaining approval for the WUG process, was associated with the extensive time satellite STI clinic nurses were spending applying for and gaining WUG approval (see Table 2). A study by McFadyen and Rankin identified that research involving vulnerable populations, often have gatekeepers outside the ethics approval process who may contribute additional barriers for researchers⁴². Apa et al.'s study exploring the challenges and strategies to conduct research in prisons had similar findings, highlighting the additional barriers to obtaining appropriate permissions when conducting research with incarcerated people, including the additional time required to review protocols for implementation⁴³. When developing a collaborate research relationship Apa et al., stress how establishing prison contacts, and maintaining rigorous research methods are key to successfully conducting research with incarcerated populations⁴³. In applying this learning, and to overcome the barriers experienced in this study, future practice would benefit from including the development of a statewide carceral implementation toolkit. Once approved, this toolkit could be applied to carceral environments negating the need for multiple applications, expediting the implementation of the satellite STI testing clinic. As reported in research, evidence-informed toolkits are used to facilitate the implementation of evidence-based interventions by providing resources that are adaptable and customizable, in turn accelerating the process of translating research into practice⁴⁴.

A large cohort of the incarcerated people also requested, through the open-ended survey questions, access to prophylaxis such as condoms (see Table 2). Currently, accessing these items through diverse STI and BBV preventative programs are unavailable to people incarcerated in Queensland³⁵. Yet some programs in correctional centers in other Australian jurisdictions offer access to condoms (and dental dams) through vending machines, such as NSW, VIC, Western Australia, and Tasmania¹².

Recommendations

Collaboration with policy makers It is recommended that policy makers work with correctional services to consider the implementation of a condom/dental dam distribution, for incarcerated populations within the next six months to ensure alignment with WHO recommendations⁷ and incarcerated people's right to 'the enjoyment of the highest attainable standard of physical and mental health'³¹. Additionally, these policy makers could work to incorporate this as 'core business' within state and national strategies with a large scale evaluation, including health economic evaluation for future research within the same timeframe.

Inner setting domain

The overarching theme within the inner setting domain was 'Shared vision' based on the high levels of support of implementing the satellite STI testing clinic evident both from the incarcerated peoples' open-ended survey responses, and the responses from satellite STI clinic nurses (see Table 2). Scholars have identified that successful integration of EBP require support from both the researchers implementing the intervention, and from diverse stakeholders within the organization/setting^{38,45}. Within this context, the satellite STI clinic nurses identified that the satellite STI testing program received overwhelming support from all levels within Queensland Health, and that of QCS (see Table 2). At each level of the organizations a shared vision was present, in turn playing a contributing factor to the clinic's success.

Recommendations

Continued intraorganizational cooperation, and the continued adaptability of the program It is recommended that for upscale of this satellite STI testing program, further communication, co-operation and input from all levels within Queensland Health and QCS be maintained. It is also recommended that the satellite STI clinics continue to be adapted, where and when required, considering stakeholder input at all levels. With continued senior level support, being embedded in policy, and not susceptible to changes to staffing and/or changes to ruling political parties, this program has a greater chance to continue and thrive.

Successful implementation of this recommendation will be evidenced by a continuation of open communication pathways, intraorganizational cooperation, and adaptability of the satellite STI clinic program. It is also recommended that this model, due to its adaptability, be embedded into all quality improvement

activities, to enhance EBP within correctional settings, and to enhance clinically relevant research culture. This model can also be adapted to each specific future carceral site to enhance relevance and feasibility.

Innovation domain

The overarching theme for the innovation domain related to the 'Efficacy of clinics due to the 'satellite method'. This was strongly supported by the incarcerated participants and the satellite STI clinic nurses, with both expressing the effectiveness of the satellite STI clinic method, and the need for additional days to run the clinics (see Table 2). This need also considered the delays deriving from the pathology section of the carceral setting needing to send the pathology specimen to the local hospital, and the needs of the incarcerated people to have a quick turnaround from testing to treatment, especially if an individual tested positive. Advertising of future satellite STI clinics was also asked for, and a small number of incarcerated people requested that STI testing also be made available in the medical center (see Table 2).

Recommendations

Additional days, advertising, and modes of delivery It is recommended that for the upscale of this project, satellite STI testing clinics should be delivered and offered additional days per week based on the demand outstripping the current and available financial resources. Similarly, the clinics will need to be announced and advertised in advance to provide adequate awareness that the nurses will be attending, and when. Finally, it is recommended that testing be offered in the medical center as an additional service securing accessibility. These recommendations should be implemented within the study site, and as a core component regarding the upscale of the clinics. To evaluate the success of these recommendations, additional closed and open-ended satisfaction survey questions can be included for the incarcerated population.

Strengths and limitations

This study had multiple strengths, including the innovative nature of the study and the high level of uptake and acceptance, in turn demonstrating the need for clinic upscale. A key strength of the study was the innovative delivery of the satellite method to overcome barriers that are impeding on incarcerated people from accessing STI testing, treatment and prevention within the carceral environment. This was evidenced by the nursing staff motivation, shared vision, and the incarcerated persons' desire to be healthy. The clinics were well-received with engagement from multiple stakeholders, including multiple levels within Queensland Health, and QCS. This study has the potential for upscaling and promoting STI testing, treatment and prevention through sexual health education, collectively contributing to EBP and having real-world translational impact. Through EBP, this nurse-led sexual health clinic meets the needs of incarcerated people, by providing access to sexual health services, in an environment, typically known for challenging access these services. As such, this well-utilized and accepted model could be applied to other health care interventions focused on improving access to care for incarcerated people.

There were multiple limitations to this study including significant time delays associated with data collection due to multiple external research approval processes. Another limitation was the brevity of qualitative feedback from both the incarcerated population and from the satellite STI clinic nurses. It is recommended that in-depth interviews are conducted with future participants to gain greater insights regarding barriers/facilitators associated with the satellite STI clinic to inform future quality improvements, and adaptations of the program to meet the needs of incarcerated people.

A further limitation concerned the demands for the clinic outweighing the service delivery where funding allocated to run the clinic provided limited staffing and hours. Additional staffing and availability of hours would provide a better understanding of potential demand/uptake for the satellite STI clinic. However, initial findings are promising and warrant continuation of this service with room for adaption and to be replicated in further correctional settings in Australia, including globally.

As this study was within one correctional site in Queensland, Australia, caution must be used regarding generalizability of findings to other correctional facilities, including those outside of Queensland and Australia. However, the initial findings from this exploratory study provide the potential for further widescale implementation and evaluation.

Similarly, the potential needs of diverse sub-groups within the incarcerated cohort were unknown due to the brevity of questions in the satisfaction survey, and those choosing to not engage with the pilot clinic and/or not completing the evaluation component of the satellite STI testing clinic. Likewise, although incarcerated transgender women residing in the facility were invited to utilize the satellite STI testing clinic, data related to the gender of the participants was not collected. As such, no unique data were collected concerning the transgender women who may have engaged in the service. The demographic data collected included sex assigned at birth but neglected to collect data surrounding the gender the participants identified with. Brömdal et al., highlight that transgender women within carceral setting are more susceptible to sexual violence, lack sexual health knowledge, and have reduced access to sexual health services, collectively increasing their vulnerability to contract STIs⁴⁶. This oversight translated to valuable data from a vulnerable and at-risk sub-group within the carceral setting was not considered.

This study adapted Lam et al.'s CFIR guided semi-structured interview questions, which presented to be a feasible and replicable semi-structured interviewing framework and can be applied to multiple different research environments²³. In applying these semi-structured interview questions to this study, we were able to conduct an evaluation of the constructs for the effective implementation of the satellite STI testing clinic based on the nurses' feedback. However, one limitation in utilizing this framework was the potential for unintentionally excluding themes that did not fit within the CFIR construct. The potential omission of themes was also highlighted within Lam et al.'s evaluation of the framework as a potential limitation²³. This limitation therefore also applies to our use

of deductive analysis where the strict adherence to pre-existing objectives⁴⁷, such as our research question, and codes applied from the CFIR framework meant that important underlying themes that did not fit within these constructs may have been overlooked.

Implication for policy and practice

To reach more correctional centers and more incarcerated people, the satellite STI clinic initiative is intended to be upscaled. With potential changes to policy, strategy and funding, a national rollout has potential benefits including a larger evaluation, health economic analysis. It also has the potential to be adapted for other specific health conditions and respond to emerging needs. With an evidence-informed implementation toolkit, the aspiration of reaching more correctional centers and providing adequate care to more incarcerated people are in reach with the provision of adequate funding and resources. The findings of this study have the potential to inform sexual health education programs, sexual health education materials, and future policies focused on the improvement of health outcomes for incarcerated people, including other relevant vulnerable, at-risk and priority sub-groups.

Conclusion

Overall, this study considered the barriers and facilitators to implementing a nurse-led satellite STI clinic to improve STI testing, treatment, and prevention in a male correctional center in Queensland, Australia. Results of the qualitative analysis highlight that the clinic was well-received by both incarcerated participants and satellite STI clinic nursing staff, and that education plays a pivotal role in ensuring long-term success and sustainability of such initiatives. Future research may benefit from including adapted versions of the semi-structured interview questions when evaluating new interventions and expanding on the open-ended satisfaction survey questions to be more nuanced in nature exploring the barriers and facilitators of the satellite STI testing clinic more in-depth.

Data availability

The participants of this study did not give written consent for their data to be shared publicly. Similarly, due to the sensitive nature of the research, supporting data are not available.

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Author contributions

A.B. conceptualized this study, wrote the manuscript, and prepared all figures and tables. L.E. oversaw the entire study from conceptualization to final draft. A.M. conducted interviews with clinic nurses. A.B. and A.Br. conducted data collection through medical chart audits. A.B., A.M., A.Br., K.K., S.O., and L.E. all contributed to the design, method selection, development, and revision of this study. All authors have reviewed the final draft of the manuscript.

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Competing interests

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Additional information

Correspondence and requests for materials should be addressed to A.B.

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