

# User experiences of an AI application for predicting risk of sexually transmitted infections

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## Abstract

**Objective:** Awareness of one's individual risk of sexually transmitted infections (STIs) and human immunodeficiency virus (HIV) is a necessary precursor to engagement with prevention strategies and sexual health care. Web-based sexual health applications may improve engagement in sexual health prevention and care by providing individualised and evidence-based sexual health information. The STARTOnline (*Supporting Timely and Appropriate Review and Treatment Online*) study sought the views of sexual health service users on three web-based sexual health applications to better understand their usefulness, acceptability and accessibility. This paper reports the views and experiences of users of one of the applications called MySTIRisk. MySTIRisk estimates the risk of three common STIs and HIV using data from attendees of a metropolitan sexual health service.

**Methods:** This study used a bespoke qualitative design, informed by a developmental evaluation approach. Melbourne Sexual Health Centre clinic attendees' views were sought using semi-structured interviews conducted between October 2023 and January 2024 via videoconferencing, telephone and on site at the clinic. Data was analysed using qualitative data analysis methods.

**Results:** A diverse group of 14 participants described an ideal pathway to better sexual health outcomes that might be facilitated by use of the MySTIRisk application, particularly for individuals with limited sexual health knowledge, or affected by stigma and geographical barriers. This pathway was described as: 1) *being concerned about my sexual health*; 2) *checking my STI risk easily and privately*; 3) *understanding and trusting the result*; and 4) *deciding how to look after my health*. Factors that might influence this pathway were also described, including areas for improvement in accessibility and acceptability.

**Conclusion:** These findings support the role of web-based sexual health applications in facilitating access to sexual health education and behavioural change and underscore the importance of codesign approaches in improving their uptake and impact.

## Keywords

Sexual health, artificial intelligence, machine learning, qualitative, health communications

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## Introduction

Early diagnosis of sexually transmitted infections (STIs) and human immunodeficiency virus (HIV) is important in avoiding negative sequelae associated with untreated infections and reducing the likelihood of onward transmission.<sup>1</sup> Individuals may be unaware of an STI or HIV in the absence of symptoms prompting them to seek testing. Engagement in asymptomatic STI screening may prevent negative health outcomes such as pelvic inflammatory disease, miscarriage, and neurological damage.<sup>2–4</sup> Moreover, despite advances in HIV prevention and treatment, late detection of HIV remains a barrier to achieving elimination in high income countries.<sup>5</sup>

Digital sexual health applications have been found to be effective in achieving greater engagement with sexual health care.<sup>6</sup> However, research to date has focused on the use of broadcasting mediums such as social media and short messaging services (SMSs),<sup>7,8</sup> highlighting confidentiality and privacy concerns intrinsic to these platforms. Web-based sexual health applications offer an alternative means of providing individualised sexual health information. Research seeking user feedback on “risk calculators,” using decision trees based on published data and screening guidelines, suggests they may be helpful.<sup>9,10</sup> Seventy per cent of users of the Check Your Risk, rated it as useful or very useful<sup>9</sup> and 90% of RiskRadar users said they would use the site again<sup>10</sup> but neither study sought more expansive feedback through qualitative research methods.

Despite recent proliferation of studies using machine learning to identify potential candidates for sexual health prevention interventions,<sup>11</sup> the application of this technology to provide individualised sexual health information is yet in its infancy. Risk assessment using artificial intelligence (AI) to compare user inputs with large data sets demonstrates acceptable model performance.<sup>12,13</sup> However, studies of user views’ on AI-powered tools have been limited to user views on conversational agents (i.e., chatbots) to support access to sexual health services and adherence to HIV pre-exposure prophylaxis.<sup>14,15</sup> As such, little is known about how these tools might best support sexual health outcomes.

The STARTOnline (*Supporting Timely and Appropriate Review and Treatment Online*) study sought the views of sexual health service users on three web-based sexual health applications developed by researchers at the Melbourne Sexual Health Centre (MSHC): iSpySTI (ispysti.org); MySTIRisk (mystirisk.mshc.org.au); and AiSTi, an image recognition application currently under development. The study sought to better understand the usefulness, acceptability and accessibility of these applications and inform their further development. This paper reports the views of users of the MySTIRisk application. The term application in this paper refers to web-based applications (i.e., those accessed via a website rather than a smartphone application) unless otherwise specified.

## Methods

This manuscript was written in accordance with the *consolidated criteria for reporting qualitative studies (COREQ)*<sup>16</sup> (Supplement 1). Adopting a developmental evaluation approach,<sup>17</sup> this research employed a bespoke combination of qualitative data collection and analysis methods, described below, to explore the usefulness, accessibility, and acceptability of the MySTIRisk application to potential users. A social constructionist paradigm informs our understanding of sexual health as a phenomenon strongly influenced by social factors impacting access to health information.

### Description of the MySTIRisk application

MySTIRisk is a web and AI-based sexual health application that provides users with an estimate of their STI and HIV risk. The application was developed and validated<sup>12</sup> by researchers at MSHC, a large publicly funded sexual health clinic in metropolitan Melbourne, Australia. The infographics used in the tool were also chosen following a cross-sectional vignette study assessing the effectiveness of several displays of STI/HIV risk.<sup>18</sup>

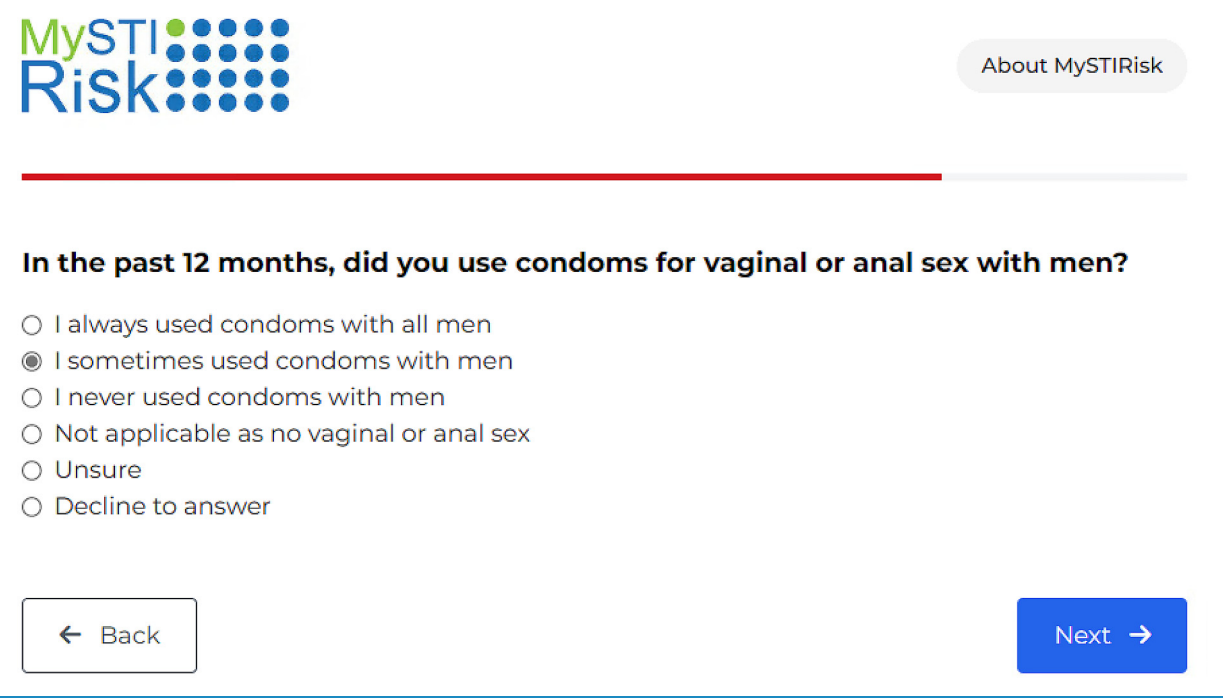
A brief video at the start of the application explains how it was developed and how it estimates an individual user’s risk. A second page advises users that the site does not collect identifying information but that anonymous user inputs may be used for research and evaluation. It also advises users to discuss the information provided by the site with their doctor, rather than relying upon it as their sole source of advice.

After accepting the privacy and disclaimer statements, users then answer a series of questions about their demographic characteristics, use of STI and HIV prevention strategies and sexual practices (Figure 1). User responses are input into MySTIRisk machine learning models that have been trained on data collected from a computer-assisted self-interview questionnaire completed by MSHC attendees over a 10 year period.<sup>19</sup> This allows the models to estimate the risk of a person with the same responses having an STI or HIV.<sup>12,13</sup>

The risk report page of the application shows a risk meter with an overall risk of STIs (Figure 2) followed by a detailed risk report which provides the risk of four infections (HIV, syphilis, gonorrhoea, chlamydia) for a person with the same answers who attended MSHC. The full risk report and general recommendations for reducing harm associated with STIs are provided in a downloadable report (see Supplement 2).

### Recruitment and sampling

Participants meeting the criteria in Table 1 were recruited to this study from attendees of MSHC via two rounds. Firstly, participants in a previous survey regarding their preferred



**MySTIRisk**

About MySTIRisk

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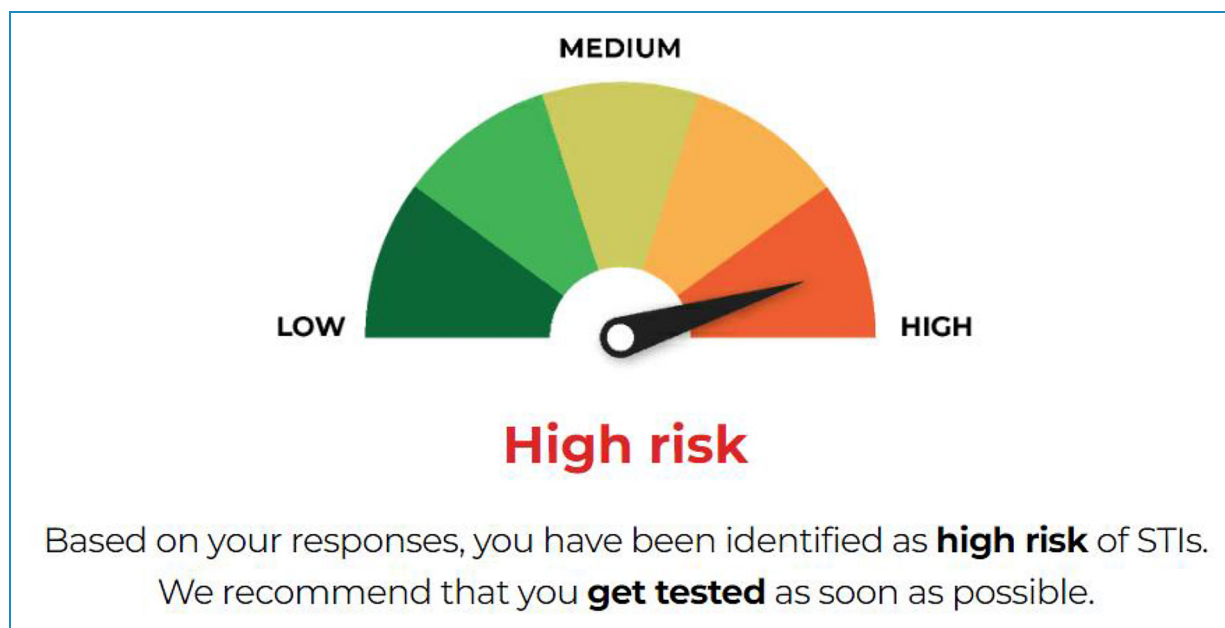
**In the past 12 months, did you use condoms for vaginal or anal sex with men?**

- I always used condoms with all men
- I sometimes used condoms with men
- I never used condoms with men
- Not applicable as no vaginal or anal sex
- Unsure
- Decline to answer

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**Figure 1.** Example question from MySTIRisk application.



**Figure 2.** An example of the risk display used in STI risk report page of MySTIRisk application.

risk display<sup>18</sup> were invited to provide their contact information to be contacted for an interview. Participants who provided their details were purposively sampled to ensure representation from a range of age groups, genders, and sexual identities. To further achieve a diverse sample, a second round of recruitment invited demographic groups

not represented in participants previously interviewed. Specifically, females under 24 years of age and recently arrived in Australia (<5 years), who had attended MSHC in the two weeks prior, were contacted. All potential participants were first contacted by SMS or email and invited to call AK directly or nominate a time for her to call them.

**Table 1.** Participant inclusion and exclusion criteria.

Inclusion criteria	Exclusion criterion
Prior consent provided to be contacted for research  18 years or older Currently residing in Australia	English language proficiency precluding the use of the MySTIRisk website

During this conversation, an overview of the research was provided and a time scheduled to conduct consent and data collection procedures.

### Data collection

Semi-structured interviews were conducted by AK from October 2023 to January 2024. A bespoke interview guide (Supplement 3) was developed in consultation with the research team using a narrative interviewing approach to address the research aims. All participants were asked for feedback following their interview and none expressed discomfort or concern regarding the interview questions. Additionally, TP listened to the audio recordings of the first two interviews and recommended no changes to the interview questions. Participants were given the choice to meet via Zoom videoconferencing, telephone or in person at MSHC, and no others were present during interviews. AK was not known to participants nor involved in their clinical care. AK is a PhD qualified research fellow with experience in conducting qualitative research with health service users. Prior to the interview recording, AK explained she was not a sexual health clinician nor involved in the development of the MySTIRisk application prior to the current research. A demographic questionnaire, developed for this study, was then administered by AK (Supplement 4). Interviews were audio recorded and transcribed by a professional transcription service. Participants were offered the opportunity to review an interview transcript or a single page summary of the researcher's interpretation of their interview. Reflective field notes were recorded by AK following each interview. No repeat interviews were conducted.

### Data analysis

Interview transcripts were checked for accuracy and coded manually using NVivo 20 software by AK. Each transcript was coded three times using descriptive, action and emotion coding.<sup>20</sup> Descriptive coding adopted a deductive approach, addressing each of the interview questions, and action and emotion coding adopted an inductive approach. A summary of the descriptive coding was sent to participants who requested it ( $n=13$ ). One responded with a suggestion

that sex on premises venues could be a potential site for promoting the application. Action and emotion coding summaries were also written for each participant after coding. Similar action and emotion codes were grouped into pattern codes<sup>20</sup> throughout the coding process. Interview analysis occurred concurrent to data collection to allow for exploration of questions arising from the analysis and to monitor for data saturation. Following the analysis of five, nine, 12 and 14 interviews, a concept map<sup>21</sup> of prominent concepts was progressively modified and reviewed by TP, EC and CK. TP also reviewed a selection of transcripts and coding summaries for consistency with the concept maps. When no new concepts were identified between the twelfth and fourteenth interviews, it was agreed to end recruitment. The final concept map was used to further group pattern codes into four major and eight minor concepts. Data for each of the four major concepts and their related minor concepts was reviewed to produce four concept descriptions (see Supplement 5 for example) which form the basis of the results reported below.

### Ethical review and consent

This research was approved by the Human Research Ethics Committee of Alfred Health (approval no. 39/23). Informed written or verbal consent was obtained prior to data collection procedures. No participants withdrew following consent. Participants received an AUD \$50 e-gift voucher.

## Results

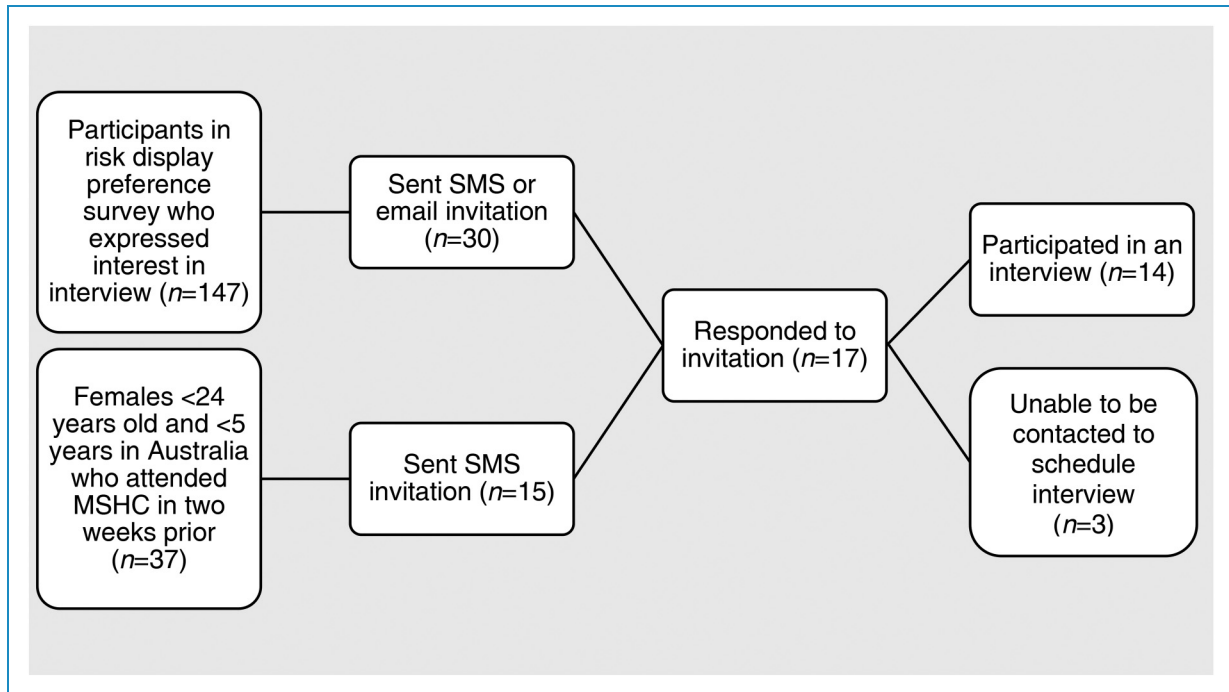
### Participant characteristics

Fourteen sexual health service attendees participated in interviews of 27 to 76 min duration (mean = 43 min, SD = 11) via Zoom ( $n=7$ ), telephone ( $n=6$ ) and in person at MSHC ( $n=1$ ). Figure 3 shows the number of people invited to participate in a research interview and the number who responded. Of these, three were unable to be contacted to schedule an interview.

As shown in Table 2, participants represented a diverse group of sexual health service users of varied ages, genders, sexual identities and backgrounds.

### Potential pathway supported by use of MySTIRisk application

Key concepts reflected in the experiences and perspectives of participants in this research are mapped in Figure 4. In brief, participants described a potential pathway to better sexual health outcomes that might be facilitated by use of the MySTIRisk application, shown in black rectangles in Figure 4. *Being concerned* about their sexual health prompts people to seek sexual health information. The MySTIRisk application offers a means of users *checking*



**Figure 3.** Recruitment to interviews.

[their] STI risk easily and privately. Understanding and trusting the result provided by the application could positively influence them deciding to look after [their] health. Factors described by participants as influencing the likelihood of them initiating use of the application and progressing along this intended pathway are shown in the circles in Figure 4. These factors relate to users' views on the usefulness, accessibility, and acceptability of the application. The data informing each of the four steps in the pathway and influencing factors is described in more detail with exemplary quotes in the text that follows. Participant names are pseudonyms, except where participants explicitly requested and gave permission for their names to be used.

**Being concerned about my sexual health.** Participants described being concerned about their sexual health as being “nervous,” “anxious,” “upset,” “worried,” “stressed,” “paranoid” and “unsafe.” Most participants were prompted to seek sexual health information in the context of experiencing symptoms of a potential STI.

If everything's going all right, I wouldn't go to [the] MSHC website, but if I need more information for a lump or a bump. . . or if there's anything not normal with my sexual organs, I would definitely go. (Mano, straight man, 25–34 years)

An awareness that they had recently engaged in sexual practices that placed them at risk of an STI could also prompt concern about their STI status: “There would be times when I'd be engaging in higher risk activity and

then really worrying” (Aoki, pansexual non-binary person, 35–44 years).

**Checking my risk easily and privately.** The main advantages of the MySTIRisk application described by participants related to the convenience and anonymity of accessing information online. The application was similar to internet search engines in being a potential starting point for healthcare seeking: “I think it's certainly handy to have if you want to have a quick look and see whether you are at risk. And then take it from there” (Truman, straight man, ≥55 years). The application was also accessible at any time of day without the need to travel: “That's a benefit with this AI thing. You can do it any hour of the day” (Marike, straight woman, 18–24 years). Participants preferred the application to “Dr Google” in that it provided a single point of trusted sexual health information: “People want easy access because [they] don't want a thousand and one answers. It just confuses people. If you trust one website and [it has] all the answers that [you] need, I think people would just go to one website” (Sasja, straight transgender woman, 35–44 years).

For most participants, the questions asked in the application were “straightforward,” and the limited number of questions and responses avoided unnecessary user burden: “There's not too many questions to answer, within those questions there are only a few options that you can pick and I feel like it was kind of foolproof” (Jett, bisexual woman, 18–24 years). However, trans and gender diverse people, and their partners, found the

**Table 2.** Participant characteristics ( $n = 14$ ).

Characteristic	No. of participants
Age group	
18–24 years	5
25–34 years	6
35–44 years	2
45–54 years	0
≥55 years	1
Gender	
Woman or female	6
Man or male	5
Non-binary	2
Transgender woman <sup>a</sup>	1
Assigned sex at birth	
Male	7
Female	7
Sexual identity	
Straight (heterosexual)	6
Gay or lesbian	2
Bisexual	1
Different term	4
Don't know	1
Born in Australia	
Yes	5
No	9
<5 years in Australia	6
Sex work in 12 months prior to interview	3
Living with HIV	1

<sup>a</sup>Self-identified gender.

limited range of responses impacted the accessibility of the application.

The problem is I can't get through. . . . I did click on female. . . . but I didn't continue because. . . . there were definitely questions just for female instead of transgender female. . . . To be honest, I feel like we [are] being axed out – I mean, what's the point of putting transgender there and then we can't access it? (Sasja, straight transgender woman, 35–44 years)

Users' access to sexual health information through means other than online was mediated by stigma associated with sexual health: "Back home in [my home country] sexual health is. . . a taboo for most the people. So, there's no sexual health or sex education" (Frankie, gay man, 25–34 years). Participants saw the tool as overcoming discomfort associated with discussing sexual health.

If you are feeling a little bit nervous or you don't really feel comfortable speaking to someone about it, having a tool where you can actually put in what's going on in your life if you are sexually active would be absolutely awesome. (Riley, gay man, 25–34 years)

A sense of anonymity was supported by not needing to provide identifiable information: "I feel like I really didn't put in any information that was too specific to myself that could be identifiable. I'm glad it was all just, like, demographic questions" (Jett, bisexual woman, 18–24 years). While several noted a smartphone app may further improve the site's convenience for frequent users, concerns about people seeing the app on their phone screen would influence the likelihood of downloading it.

I'd download the app because, if it's always there, then you can always check rather than having to put the website in. . . . as long as the logo of the app is not in-your-face and it doesn't scream STI or sexual health. (Bo, straight woman, 35–44 years)

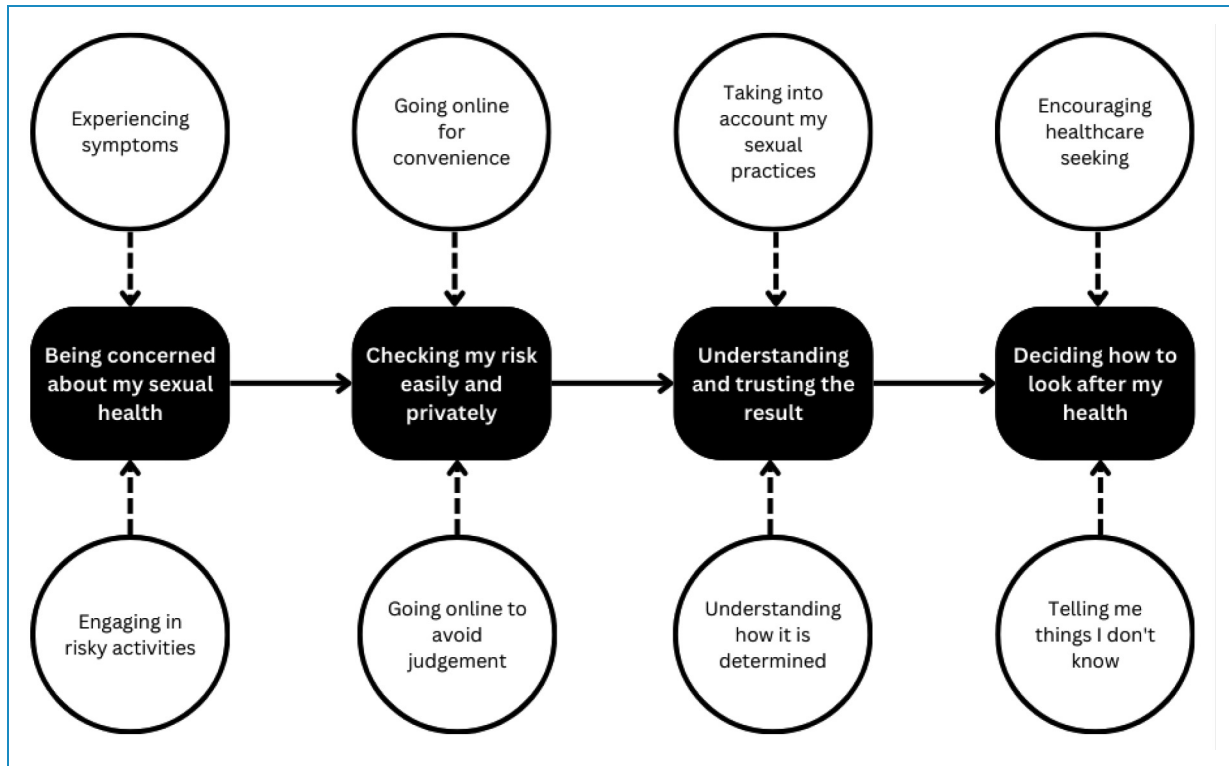
**Understanding and trusting the result.** Participants varied in their understanding of how the application worked and their trust in the results it provided. Those who viewed the introductory video found it helpful.

When I looked over the video. . . the person mentioned that it was data that would be based on AI that was generated from people who had actually visited the center and, through people selecting responses, it would be compared to that and then the AI would generate the response. . . . So, from that, I'm able to understand that you can't conclusively diagnose me. (Amura, asexual-cupiosexual man, 25–34 years)

Participants cautioned, however, that some users may "skip" important information: "When I click into it, I saw a one minute and 30 seconds video but, when I'm in such a rush, I'm worried if I have the risk" (Ellis, straight woman, 18–24 years). Moreover, participants suggested simplifying language and providing translation to languages other than English.

Language barriers. That's the only thing [that will make] people stop using it because some of them do not understand. . . . Some of them only know basic English. . . . Yeah, so fancy words they probably wouldn't know. (Sasja, straight transgender woman, 35–44 years)

Participants indicated that the risk meter display was effective in communicating their level of risk: "I like the visual aid you use at the end, kind of like, the fire safety rating vibe. . . . I think it's good to give people a visual" (Narain, pansexual non-binary person, 18–24 years).



**Figure 4.** Potential pathway supported by use of MySTIRisk application.

Participants' trust in the accuracy of the results the application provided varied. Having a personal experience of a recent STI strengthened users' belief in the application's accuracy: "It said I have a high risk and, I mean, that has been true. So, I feel like it was accurate. . . . because I have been tested and it came back positive, just recently" (Jett, bisexual woman, 18–24 years). Trust in the service that developed the application also supported trust in the application: "I think I'd probably click on [the link to the MSHC website] first before doing the test. . . . just to put my mind at ease" (Truman, straight man, ≥55 years).

Trust in the results provided by the application was reduced by the users' sense of the application not eliciting, or "taking into account," factors they felt increased or decreased their STI risk: "I had a partner who was poly[amorous]. . . . she does regular tests, but even during, if it's three, four months period, the risk can be high" (Mano, straight man, 25–34 years). Conversely, people who only had condomless sex with an exclusive partner after testing felt their risk to be overestimated. Trust was also eroded by questions and responses not reflecting diverse identities and sexual practices.

I'd say [I do trust it] about 75 per cent. . . . Once it adapts to, I guess, modern society, how we identify as humans and how we look at our bodies and how we check for STI risks, then I'd be 100 per cent. (Cil, queer woman, 25–34 years)

The degree of trust in the relevance of the result to their current situation influenced users' level of concern when receiving a high-risk result. Participants indicated the results may cause them concern were they not engaged in testing but that concern would prompt them to take action.

If it was before I did the test, I probably would have felt like it was quite upsetting and concerning. But it also would mean that I would have gone to get tested as soon as possible. So, that's maybe also a good thing, being a little bit upset so you actually do something about it. (Helia, woman, 18–24 years)

**Deciding how to look after my health.** While participants were engaged with sexual health services, they intimated the value of the application to those less familiar with STIs and sexual health services.

Thinking about me ten years ago this would have been amazing. Like, this absolutely would have been game changing stuff. . . there's so many questions that run through your mind not knowing how to look after yourself. If I had this tool, I would have been a lot more educated to go and get checked up for things that have actually popped up. (Riley, gay man, 25–34 years)

Additionally, participants felt seeing their STI risk might help those reluctant or ambivalent about seeking sexual health care to take action.

Maybe for those who can't make up their mind to go to the hospital and they think, "Oh, I might be okay" and then if he or she does the test and, like, "Oh, I have a medium risk, I have high risk so I think I need to go the hospital." It may help them to make the decision. (Ellis, straight woman, 18–24 years)

Links to sexual health information in trusted websites were also described as preparing users for a potential positive result, particularly if they included other common STIs, such as herpes.

I thought I had thrush and then I went into the clinic and . . . they turned round to me and said it was herpes. And, I didn't even have a clue. I was, literally, broke down in tears. I was crying out like, "What even is that? Is that bad?" Like, I'd never even heard anything about it before. . . . And then I educated myself on it. . . . The stigma around herpes. . . . [means that] nobody really knows [about it]. And, when I speak to my friends about it, or if I have a partner, they don't really get it because they're not educated on it. (Bo, straight woman, 25–34 years)

Most participants in this study were aware of their STI risk and reported taking measures to reduce the risk or harm associated with STIs, such as engaging in regular STI testing: "It didn't really shock me or make me feel any way because it's just enforcing what I know I need to do" (Bo, straight woman, 25–34 years). They did, however, express a preference for more tailored guidance in the recommendations provided.

So, from my results saying that I have an average risk, is that worthwhile following up on with a medical professional? . . . I don't know what average people do. . . . How do I know what to do with that information, from that point? (Amura, asexual-cupiosexual man, 25–34 years)

Most participants in this study reported using the application would not change their sexual practices: "The reminder that that risk is still reasonably high in community standards is probably useful, but I don't think that's going to help change my behaviours, necessarily" (Aoki, pansexual non-binary person, 35–44 years). One young woman indicated she would start using condoms.

At the bottom of the risk report it has a thing that says a hundred people out of a thousand people get it. And the one with chlamydia is so high. So, I'm definitely just like wrapping it up [using condoms] now. (Jett, bisexual woman, 18–24 years)

## Discussion

This research examined the experiences and perspectives of Australian sexual health service users who had used an AI-powered web-based sexual health application. The application uses AI to compare user responses to a brief questionnaire with a large, anonymised data set, from attendees of a sexual health service, to provide users with an estimate of their individual risk of testing positive for common STIs and HIV. Participant feedback indicated the site to be most helpful in supporting those with limited sexual health knowledge, including those affected by stigma and geographical barriers, to make informed decisions about STI and HIV prevention (e.g., condom use, HIV prophylaxis, vaccination) and harm reduction (e.g., testing). They also identified areas for improvement in supporting the accessibility and acceptability of the application.

Specifically, this study found that potential users would be most likely to be prompted to use the tool when concerned about their sexual health, in response to experiencing symptoms or having engaged in sexual activities they perceived as carrying a risk of STI transmission. The tool leveraged the advantages of online services in overcoming barriers that might limit access to in-person or telephone sexual health advice, such as geography and opening hours, but also fear of stigma related to presenting to a sexual health clinic or asking questions of social contacts. The influence of the information provided was limited by users' comprehension and trust in the result which was mediated by whether it took into consideration factors they deemed salient to their STI risk and their understanding of how the result was determined. Users described that the tool's call to action in encouraging healthcare seeking, as well as providing new information, had the potential to influence decision making about STI prevention and care, when preceded by trust in the tool.

The experiences shared by participants in this research support the potential role of web-based sexual health applications in facilitating access to introductory sexual health information that may be lacking from other sources of sexual health education, such as schools, peers, parents, and public education campaigns. Participants' access to sexual health information through these sources was sometimes limited by public and internalised stigma associated with sexual practices outside cultural and heteronormative ideals, which have been found in other research to vary geographically.<sup>21–23</sup> This finding supports the benefits of an online delivery of sexual health information in reaching groups who may fear status loss and discrimination in seeking information by other means.<sup>24</sup> Selection of linked information should, thus, be guided by the aim of facilitating a sex positive approach to sexual health prevention and care.<sup>25</sup>

Participants felt that applications such as MySTIRisk may provide more relevant information than internet



search engines, supporting them to “get educated” and modify health-related behaviours (e.g., healthcare seeking, use of prevention strategies). However, they also felt that further development of the application to provide more tailored information about factors contributing to their risk and reducing STI related harm (e.g., frequency of testing, use of HIV prophylaxis) would be helpful.

The surprising finding that participants mostly wouldn't seek out sexual health information unless experiencing symptoms, emphasises the need for integration of risk-assessment applications with applications designed to assess potential symptoms of an STI, including other common STIs (e.g., <https://ispysti.org/>). Given that noticing a lesion may prompt concern, inclusion of information on conditions which may be distressing to people seeking sexual health care, such as herpes,<sup>26</sup> is also recommended.

Participant criticisms of the MySTIRisk application related primarily to the accessibility of the application to a diverse range of users, including trans and gender diverse users, those who don't read English or are disabled. Historical data used to train the application model did not include trans and non-binary gender identities. This data is now being collected at MSHC and will be used to improve its accessibility to trans and gender diverse users. Participants also shared other suggestions for improving the application that will inform its further development. These findings underscore the importance of implementing codesign approaches in the future design of data collection instruments and digital health application development to maximise the acceptability and accessibility of applications to a wider audience.<sup>27,28</sup>

Despite the candour of participants in raising criticisms of the application, none expressed concern about the use of anonymised patient data to train the AI algorithm used in MySTIRisk application. Participants were also unconcerned about entering non-identifiable data about themselves and their sexual practices into the application for the purpose of receiving a risk prediction. Given the ubiquitous collection of data by other actors in our daily lives, it seems likely that users of free services, clinical and online, see the giving up of personal information as an acceptable trade-off. Nonetheless, comments from our participants and users of online testing services suggest structuring consent procedures to nudge users to consider the information more carefully may improve understanding and trust in providers.<sup>29</sup>

### *Comparison to previous research and future directions*

To date, research exploring user views on digital applications for the promotion of sexual health has primarily focused on the use of broadcasting mediums such as websites, SMS and social media interventions.<sup>6</sup> Meanwhile, research into the application of AI in this space has

focused on proof-of-concept studies<sup>11</sup> and user views of conversational agents to support engagement with prevention and care.<sup>14,15</sup> This study is the first to leverage the power of qualitative research methods to expansively explore users' views on an AI-powered sexual health risk-assessment tool.

### *Implications for practice*

The findings of this study suggest several implications for healthcare providers, policymakers, and developers of sexual health applications. Firstly, that investment in the development of applications is likely to be wasted if not accompanied by adequately resourced sexual health promotion strategies. Alongside traditional methods of sexual health education (e.g., schools and universities), social marketing and peer-to-peer education, engagement with newer means of reaching target audiences such as search engine optimisation, social media content creation (e.g., Instagram reels) and use of trusted messengers (e.g., influencers) are needed. Such approaches may help to facilitate the normalisation of sexual health prevention and care seeking through sex positive messaging. Secondly, the finding that most participants wouldn't seek sexual health information unless experiencing symptoms suggests the need for the integration of risk calculators, such as MySTIRisk, with applications better designed to assess symptoms of STIs. Lastly, while a small number of participants would have preferred more tailored sexual health advice, the purpose of sexual health applications should be emphasised as facilitating rather than replacing clinical care, whether it be delivered by online self-testing and telehealth mediums or in person in a clinic. In addition to the limitations of the training data set on which AI algorithms are based, digital applications may contain inherent (e.g., poor internet access) and modifiable (e.g., language) barriers to access for some users. As such, a combination of authentic human-centred design of digital applications and advocacy for alternative models of health promotion and care (e.g., community outreach) is warranted.

### *Strengths and limitations*

Use of a qualitative research design employing interviews with a diverse and engaged participant group allowed for the exploration of a wide range of feedback not possible with other research methods. Offering participants the choice of interview medium appeared to support the inclusion of a more diverse group of participants and, as reported in other studies,<sup>30,31</sup> was not observed to impact data collection or analysis.

This research was limited in capturing the views of the potential target audience for the application, as participants were existing users of sexual health services. Moreover, demographic data relating to participants' socio-economic

status, educational background, or previous experiences with sexual health applications was not sought or offered by participants, limiting the consideration of the applicability of findings to other users. However, it should be noted that participants' reflections extended to their past experiences and those of people they knew. While the aim of qualitative research is to offer depth and breadth rather than generalisability, the findings of this research have informed the design of a discrete choice experiment survey seeking the preferences of a wider group of potential users, drawn from outside a sexual health clinic setting. Future qualitative research should seek to recruit users not engaged with sexual health services to explore differences in perspectives.

Given the use of interviews, social desirability bias may have influenced some participants' report of their sexual health-related behaviours. Similarly, as users of the sexual health service who developed the application, participants may have tempered their criticisms of the application.

## Conclusions

The views of sexual health service users on an AI application, designed to provide an estimation of an individual's STI and HIV risk and links to sexual health resources, suggest its primary value is to those with limited sexual health knowledge and engagement with health services, due to limited experience, stigma or geography. Use of human-centred and participatory approaches in the development and implementation of digital sexual health applications is central to achieving their intended impact.

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