Can chatbots help with contraception?
Background

A chatbot is a computer program that is designed to have a conversation with humans. Chatbots can help with contraception by providing rapid and responsive information, counselling and linkages to products and services. They can also serve as a navigational agent and companion on a reproductive health journey or be gamified and serve as ‘edutainment.’

There is a small, but expanding literature within healthcare on chatbot design, user experience and the outcomes of chatbot use. However, no attempt has been made so far to review the literature and understand how chatbots can help people use contraception.

This learning brief summarises the key findings of a systematic review that examined whether and how chatbots improve contraceptive knowledge, attitudes, and behaviours. We also draw together best practices for designing and developing chatbots to help people use contraception.

Methods

We systematically searched and collated peer-reviewed, original research, and grey literature sources published between January 2010 and September 2022. We looked for papers where there was reporting of intervention outcomes and data collection methods. We defined outcomes to include contraceptive knowledge, access to information and use of services, contraceptive uptake, contraceptive continuation and communication or negotiation skills.

The evidence base

- There is little evidence to assess the effectiveness of chatbots in impacting contraceptive knowledge, attitudes, and behaviour. We identified 15 sources, 8 original research articles and 7 grey literature articles. This included one RCT, one small cohort study, one predictive model development report, two development reports and one grey literature report on chatbot impacts on contraceptive behaviours.

- The majority of chatbots (8) in the review were implemented in high income countries. Seven chatbots were implemented in low- or middle-income countries, that is, three in Kenya and one each in South Africa, Uganda, Nigeria, Bangladesh, and India. One chatbot had international reach.

- Four chatbots aimed specifically to engage the general population and six sought to engage women and girls. Two of these specifically targeted young women; one targeted adolescent girls and one targeted pregnant women. Three chatbots were aimed at adolescents of any gender. One chatbot was aimed at married couples and one targeted those at risk of poor sexual health.

- The chatbots described in our sources had a range of personas. Three had a female peer persona, two had robot personas that were neutral in age and gender, two had knowledgeable female personas, two had female health care worker personas, 4 did not have a persona and two sources did not report on the persona.

- Chatbots were hosted on a range of platforms, including a website, or via applications, such as WhatsApp, Facebook Messenger and SMS text messages.
Main findings

We found that the evidence on whether chatbots improve contraceptive knowledge, attitudes and behaviours is sparse and conflicting. One RCT suggests no effect on intention to use contraception, a small cohort study suggests increased uptake of contraception in adolescent girls and a development report suggests no impact on access to services. There is poor quality evidence to suggest increased contraceptive knowledge from interacting with chatbot content, as measured by in-chatbot quizzes.

The chatbots included in this review showed limited user reach and engagement varied, from over 100,000 users in 5-months, to under 10,000 in 6-months. The reporting of engagement outcomes is highly variable and the description of the marketing strategies employed to drive engagement is limited.

There is high variability in user feedback on the acceptability, convenience and accessibility of chatbots. Chatbots to improve contraceptive outcomes were seen as acceptable, convenient, and private by some users. However, some other users experienced chatbots as incompetent, impersonal, unsympathetic, reported technical difficulties and found interaction burdensome. Users appreciated the anonymity of talking to a chatbot but some users had concerns about the privacy of the data captured by the chatbot.

There was no evidence available on the costs or cost effectiveness of chatbots for impacting contraceptive knowledge, attitudes, and behaviours.
**Recommendations on best practices in designing and developing chatbots**

We reviewed the evidence to identify best practice recommendations that emerged from more than one study:

- **Chatbots should be designed and developed with input from their target audience.** Users need to be at the centre of chatbot design and development work. We need to understand different user needs, interests, and realities, including whether a chatbot is a channel they can engage with. Evidence on the varied levels of engagement with chatbots suggests that this is an area that needs further work. For example, SnehAI, one of the chatbots we looked at in this systematic review, engaged users who self-reported as 93% male and 6.8% female. The authors attributed low female engagement to the high levels of stigma and shame experienced by young women in this context around engaging with sexual and reproductive health content.

- **Chatbot use for contraceptive information is a new behaviour, which means that users need additional support for engaging with a chatbot.** As is the case with adopting any new health technology, it is important that users are given information on chatbots. They need to be given instructions and guidance on how to use them and why to use them, particularly if they are first time users.

- **A chatbot should be designed to be intuitive and it should be easy to use.** To encourage engagement with a chatbot, they should be developed on commonly used devices and platforms. To avoid drop-offs, the user experience needs to be made frictionless and seamless, and users should not be required to go through any superfluous steps.

- **Linking a chatbot with a reputable and well-known organization can build user trust.** Evidence from the systematic review suggests that users experienced chatbots as trustworthy when the chatbots seemed to give accurate answers to their questions and if the chatbots were associated with a reputable organization.

- **The persona of a chatbot should reflect the intended relationship to the audience.** For example, the persona of a peer, a health care worker or neutral robot may influence user behaviour in different ways.

- **User privacy should be ensured and visible while engaging with a chatbot.** Despite the anonymity offered by chatbots, concerns with data privacy may prevent people from engaging with chatbots. Being transparent about how the captured data will be used will assuage these concerns and increase trust in the chatbot.

- **Those requiring urgent help from a chatbot may also need some access to human support.** For example, users, particularly young people, exploring sensitive and important topics may need human intervention. This could include human moderation of chats or having in-person user engagement at the outset.
Implications for future research

- The evidence suggests that further research is needed to understand the impact of chatbot interventions in comparison to alternative technologies. These comparisons are essential to understand the impact of the dynamic nature of content delivery via a chatbot which may also be provided through simpler means, such as printed materials or websites.

- Further research is also needed to examine whether chatbots can improve contraceptive knowledge, attitudes, and behaviours at scale, whether chatbots are more effective among specific populations, and whether chatbots provide efficiencies in cost or value for money. Research also needs to acknowledge the variation in chatbot interventions and identify the key features associated with improved contraceptive outcomes.

- Where engagement is reported then some description of the strategies used to promote engagement is required and data on the size of the target audience is required. This is because engagement may be dependent on factors unrelated to chatbot acceptability, such as the level of promotion.
About this brief

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