

Mobile Technology for Health

It is no secret, especially to anyone who knows or works with young people, that mobile phone use is ubiquitous. In the last five years, the number of mobile phone subscribers worldwide has doubled to almost 6 billion, of which nearly a third are under the age of 30.^{1,2} Growth in mobile phone use has been particularly high in the developing world, where an estimated 80 percent of future subscribers — including millions of technologically savvy youth — reside.³

One of the most widely used mobile phone applications is short message service (SMS), also known as text messaging, which allows users to type and send messages 120-160 characters long. Rates of use for SMS in the developing world vary, but nearly all mobile phones purchased in the last few years are thought to be capable of offering this service.⁴ In a study of 441 high school students from low-income areas of South Africa, 87 percent reported sending a text message or making a call on a mobile phone during a typical day.⁵

What Is mHealth?

Mobile health, also known as mHealth, is a relatively new field that uses the incredible advances and growth in SMS and other mobile technologies to help deliver health care. Mobile phones have advantages when used in health programs for youth, as youth in general are responsive to and excited about using new technologies. Mobile phones are relatively inexpensive, portable and accessible. They also offer perceived privacy when compared with face-to-face meetings with health care providers and counselors.

Studies from around the world have proven the feasibility of using text messaging, in particular, to provide health information and test results, to remind

patients about adhering to medicines and appointment schedules, and to assist patients in managing chronic conditions like asthma and diabetes.^{4,6-9}

Because text messaging is more widespread and less expensive than most other mobile technologies, it has been the focus of many health studies and programs. However, the field of mHealth is so new that few interventions have been evaluated. In a recent systematic review of 34 ways that SMS has been used for disease prevention in developing countries, evaluations were reported for only five of the interventions.⁶

Text messaging is also increasingly being used to improve young people's access to sexual and reproductive health information and services. Here again, as with mobile health in general, few SMS interventions that address sexual and reproductive health have been evaluated, especially among youth in developing countries.⁹

One-Way Communication

In some cases, text messages are sent from a health program or provider to a group of people who are subscribed to the service, and the subscribers do not have an opportunity to respond. A successful example of this type of one-way communication is when daily messages are sent to remind young women to take their next oral contraceptive pill. In one study from the United States, young women ages 13-24 who wanted to use oral contraceptives were randomized to receive either standard care alone or standard care plus daily text messages for 180 days. The text messages provided educational information and reminded the young women to take their next pill. Six-month contraceptive continuation





rates were 9 percent higher for women in the intervention group than for women in the control group. The women who received text messages were also more likely to have used their pills consistently.¹⁰

One-way communication can also be used to let subscribers know where they can look for more information on a given topic, as well as related services. One of the first projects of this kind to address the sexual and reproductive health of youth was SEXINFO, developed in 2006 by Internet Sexuality Information Services and the San Francisco Department of Public Health. When youth in San Francisco text “SEXINFO” to a five-digit number, they are offered a variety of codes they can text to receive information on a range of sexual and reproductive health topics. Plus, all users receive referrals to youth-oriented clinical and social services. Pre-intervention focus group discussions and post-intervention surveys demonstrated the feasibility and cultural acceptability of SEXINFO and showed that it could reach youth who had multiple risk factors for contracting sexually transmitted infections (STIs).¹¹

Two-Way Communication

SMS interventions for youth can also involve interactive messaging. In this type of communication, the conversation can be initiated either by a health care provider or by a young person who has questions or concerns about his or her health.

Once two-way communication is established, opportunities arise for programs and providers to tailor the messages they send. Such personally customized messages might include a person’s name, age, sex, behavioral patterns or recent SMS responses. Research shows that tailored messages are more effective than generic messages at changing health behaviors. Tailored messages also appear to be more engaging. In a review of 14 studies that used SMS for behavior change, the two studies that used untailored messages had some of the highest dropout rates for participants.⁷

A two-way communication effort launched in 2010 by the Planned Parenthood Federation of America — The Planned Parenthood Chat/Text Program — has reached teens and young adults in more than 50 countries with information to help alleviate their sexual and reproductive health concerns. The

program offers people the choice of using online chats or text messaging to have live conversations on topics, such as emergency contraception, pregnancy testing and testing for STIs. A one-year evaluation of the program showed that 74 percent of users were under age 25 and that 89 percent were women. Among all users, 88 percent found the program either very helpful or somewhat helpful. As of February 2012, the program had supported 65,392 conversations.¹²

In 2007, OneWorld UK and Butterfly Works in the Netherlands collaborated with several nongovernmental organizations in Nigeria to launch another two-way communication project for youth, called Learning about Living, in three Nigerian states. The project, which is now available in schools across the country, uses a variety of e-learning methods to provide information and advice about adolescent sexual and reproductive health, maternal morbidity and gender equality.

As one of two mobile services offered through the project, MyQuestion allows youth to use text messaging, the Internet or a telephone hotline to submit their personal questions about health. Trained counselors from the nongovernmental organization Education as a Vaccine Against AIDS answer the questions.

A preliminary evaluation of MyQuestion showed that in the first 14 months of the project, 15,765 phones were used to ask more than 60,000 questions. About 48 percent of the questions were about HIV/AIDS, 8 percent about reproductive health services and 5 percent about family planning. Most of the users of MyQuestion and the second mobile service, described below, were under the age of 25 (61 percent) and were male (79 percent).¹³

Five years into the program, MyQuestion had responded to more than 398,000 questions from users of the service. As a testament to client satisfaction, the number of repeat users of MyQuestion increased steadily from about 1,600 in 2007 to more than 50,000 in 2011.¹⁴ And the overall Learning about Living project has been so successful in improving knowledge about sexual and reproductive health that new pilot projects have begun in Egypt, Mali, Morocco and Senegal.¹⁵

Educational Games and Incentives

SMS initiatives can also be paired with rewards to encourage youth to participate. An example is the second SMS component of the Learning about Living project in Nigeria, called MyAnswer. Once a month, the project sends subscribers a question about sexual and reproductive health or another adolescent issue, and subscribers can text their answers back, or go online to answer the question. Ten people who answer correctly each month are randomly chosen to win prizes.¹³

In 2005, PATH and its partners launched an SMS-based contest called eQuest to increase knowledge about HIV/AIDS among youth in Kenya. Youth competed in the national contest by finding answers to questions about HIV prevention, living with HIV, HIV counseling and testing, and other issues relevant to HIV/AIDS. More than 260,000 youth ages 15-24 participated in the contest, and more than 2,000 prizes – including digital cameras, music systems, mobile phones and even a home theater system – were awarded.¹⁶

New Communication Approaches

In addition to one-way and two-way communication initiatives (with or without incentives), alternative ways of using SMS to advance the sexual and reproductive health of youth are being explored and developed. In Tanzania and Kenya, FHI 360 and many local and international partners have successfully piloted an innovative service called m4RH that allows mobile phone users to access tailored information about family planning at their convenience.

The free service includes a searchable database of contraceptive options, ranging from injectables and implants to condoms and natural methods. Each menu item in the database comes with a code that users can text to a main number if they want to receive automated, evidence-based text messages about that method. The menu also includes a clinic locator to help users find the nearest clinic that offers the family planning services they need.

An evaluation of the pilot project, which began in 2010, showed nearly 45,000 hits to the m4RH system as of September 2012. During interviews,

users reported that the service improved their knowledge and behaviors. Results also showed that 82 percent of users in Kenya and 60 percent of users in Tanzania were under 30 years old.¹⁷⁻¹⁸

The m4RH project continues to gain momentum, and its content is being expanded to include weekly text messages that support positive family planning behaviors, timely reminders alerting users to renew their method or make a follow-up appointment, and interactive stories to help dispel myths and misperceptions about contraception.¹⁷⁻¹⁸ The project is also expanding to Rwanda, where it will specifically target youth and cover a broader spectrum of sexual and reproductive health issues for young people, including puberty, sex and pregnancy, HIV, and STIs.

In 2013, all of the messages developed for the m4RH project will be made available to the global health community for use in other mHealth programs. The messages were adapted from existing local and global resources for mobile phone delivery. They were then tested for comprehension and usability with adults as young as 18 in Kenya and Tanzania and with young people ages 15 to 24 in Rwanda.

WHY TEXT MESSAGING MAKES SENSE

- Mobile phones are available for as little as US\$10.
- Messages are sent almost immediately.
- Transmission is not dependent on fixed lines.
- Almost every cell phone purchased in the last few years is capable of text messaging.
- Little technical expertise is required to send a message.
- Messages can be read at the convenience of the recipient.
- Text messaging minimizes confrontation and maximizes privacy.

WHAT CAN GO WRONG

- In spite of the low cost and high availability of mobile phones, financial barriers can still limit access to this communication tool.
- Messages may not be received if a mobile phone is lost, stolen or replaced.
- Phone sharing, which is common in many developing countries, can reduce confidentiality.
- Language barriers and low literacy rates may limit understanding of text messages.
- Response times to messages can vary, depending on individual and technological circumstances.
- Fluctuations in mobile networks may reduce the ability to send and receive messages.

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What's Next?

Although not specifically involving youth, a recent study of SMS to improve knowledge about and testing for HIV/AIDS in rural Uganda showed low participation rates and only moderate success.¹⁹ Because only a small number of SMS interventions like this one have been evaluated, many questions still need to be answered. Should text messaging be combined with other mobile technologies, such as instant messaging, video messaging, and social media? Is text messaging best suited for simply improving knowledge? Can it be used effectively to link people to health services or to change behaviors that might otherwise lead to unintended pregnancies, to HIV, or to other STIs? And what particular characteristics of text messaging — such as the timing and frequency of messages, how the messages are tailored and who initiates the communication — make it most effective?

Because mobile phone use is increasing so rapidly, the use of SMS for health is also expected to increase substantially in the coming years, especially in remote areas where access to health information may be limited.²⁰ The challenge will be to close the gap between the growing use of SMS for sexual and reproductive health and the evidence backing up its effectiveness. Research will continue to address this important issue — one text message at a time.

— Kerry Aradhya

Kerry Aradhya is a science writer and editor at FHI 360. Kate Plourde, an associate technical officer at FHI 360, provided research assistance.

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