Original research article

A randomized controlled trial of the impact of a family planning mHealth service on knowledge and use of contraception

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Abstract

Objectives: mHealth, or the use of mobile phones for health, is a promising but largely untested method for increasing family planning knowledge in developing countries. This study estimates the effect of m4RH, an mHealth service in Kenya that provides family planning information via text message, on consumers' knowledge and use of contraception.

Study design: We randomly assigned new consumers of the m4RH service to receive either full access or limited access to m4RH. We collected data on outcomes by sending questions directly to consumers via text message.

Results: Response rates to the text message surveys ranged from 51.8% to 13.5%. Despite relatively low response rates, response rates were very similar across the full-access and limited-access groups. We find that full access to m4RH increased consumers' scores on a test of contraceptive knowledge by 14% (95% confidence interval: 9.9%–18.2%) compared to a control group with limited access to m4RH. m4RH did not increase consumers' use of contraception, likelihood of discussing family planning with their partners, or likelihood of visiting a clinic to discuss family planning.

Conclusion: Text messages may increase family planning knowledge but do not, by themselves, lead to behavior change.

Implications: Text messages can be an effective method of increasing family planning knowledge but may be insufficient on their own to cause behavior change.

1. Introduction

Lack of information on family planning methods continues to be a major barrier to increased use of contraception in developing countries. According to a recent analysis of Demographic and Health Survey data, the two most commonly cited reasons for nonuse of contraception worldwide, after infrequent sexual activity, were concern over side effects or health risks and opposition to contraception by the woman, her partner or others close to her [1]. In-depth studies of these causes have shown that both of these factors — concerns over side effects and opposition to contraception — are often driven by misconceptions [2,3]. For example, in urban Kenya, the area that is the focus of the intervention evaluated in this study, a recent survey found that a majority of men and women believe that contraception may cause birth defects and harm to the uterus and 39% believe that contraception can cause infertility and cancer [4].

mHealth, or the use of mobile phones for health, is a promising method for increasing family planning knowledge and promoting positive attitudes toward contraceptive use. Access to mobile phones in the developing world is high and rising [5]; disseminating information over mobile phones is

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inexpensive; and, unlike mass media, mobile phones allow for two-way interaction.

In this study, we estimate the impact of m4RH, an mHealth family planning service in Kenya developed and implemented by FHI360, a nonprofit human development organization. m4RH is a free text-message-based platform that provides information on the benefits, disadvantages and side effects of nine family planning methods as well as a searchable database of clinics that offer family planning counseling and services. m4RH consumers may also sign up to receive "role model" stories about a person facing a difficult sexual or reproductive health issue and how they resolved the issue. A previous exploratory study of m4RH consumers provided suggestive evidence that the service was increasing use of contraception [6].

We conducted a randomized controlled trial to estimate the impact of m4RH on knowledge of contraception, use of contraception and other behavioral outcomes. During the study period, we randomly assigned all new m4RH consumers to receive either full access to the m4RH service (full-access group) or access only to the m4RH clinic database plus general health information messages (limited-access group).

This study contributes to the literature on the effectiveness of text messages in increasing health-related knowledge and promoting behavior change in developing countries. Previous studies have shown text messages to be effective at increasing attendance at medical appointments [7–13] and adhering to ART treatment [14,15]. Few other published studies examine the effect of text messages on reproductive health knowledge and behavior change. Castaño et al. find that daily text messages increase continuation of oral contraceptive pills [16]. On the other hand, Jamison et al. [17] find that a text message service in Uganda that provided automated responses to sexual health questions had no effect on contraceptive knowledge and led to decreased use of condoms during sexual intercourse.

2. Methods

2.1. Recruitment

Ethical approval was obtained from the Kenya Medical Research Institute ethics review committee and Abt Associates' institutional review board. As a "pull" service that only provides information upon request, FHI360 had to advertise m4RH to make potential consumers aware that it was available. To generate sufficient numbers of m4RH consumers for the study, FHI360 promoted m4RH through ads in newspapers, television and radio as well as at clinics providing family planning services and at various Ministry of Health events. These marketing activities focused primarily on urban areas.

2.2. Full-access and limited-access groups

For the duration of the study period (September 2013–May 2014), we assigned all new consumers who accessed the m4RH service to either a full-access group or a limited-access group. We assigned new consumers to each group on a rolling basis — that is, if the most recent new consumer was assigned to the full-access group, we assigned the current new consumer to the limited-access group. We consider this assignment rule effectively random for two reasons. First, m4RH had an extremely high number of consumers. Second, due to differences in network speed and coverage throughout Kenya, there was large variation in SMS delivery times. We did not seek consent from m4RH consumers prior to initial randomization as the risk to the limited-access group was low. We excluded all existing m4RH consumers from the study and continued to provide these consumers full access to the m4RH service.

We provided members of the full-access group access to all of m4RH's features including information on the benefits, disadvantages and side effects of nine family planning methods, a searchable database of clinics offering family planning services and serial "role model" stories about a person facing a difficult family planning issue.

We provided members of the limited-access group access to the clinic locator along with general motivational messages on a variety of health topics but did not provide access to any other m4RH content. We designed the motivational messages, examples of which are included in the appendix, to keep the consumers engaged with the m4RH service but not to directly affect any of the outcome measures focused on in this study. Members of the limited-access group were provided access to all m4RH content after data collection was complete; i.e., a period of 3 months.

Unlike many other mHealth services, m4RH is a "pull" rather than a "push" service. Therefore, m4RH consumers were only sent content that they explicitly requested (Fig. 1).

2.3. Data

We collected data on outcomes and covariates via text message. Due to the novelty of conducting a survey via text message, we performed several tests to determine the most effective combination of timing and incentives to encourage response and performed extensive field-testing of questions [18].

We divided survey questions into three waves as we anticipated low response rates to questions asked toward the end of the survey if all questions were included in a single survey. We sent the survey waves to each participant on a rolling basis based on the timing of their initial interaction with m4RH. We sent the first wave of survey questions to each participant approximately 24 h after the participant first accessed the m4RH system, the second wave approximately 6 days later, and the third wave approximately 3 months later. Each survey wave included an initial invitation explaining that consumers were free not to participate in the survey and that they could continue using m4RH if they chose not to respond. To prevent consumers below the age of 18 from participating in the study, we asked respondents their age at the start of each survey wave and discontinued the survey if the respondent was under 18.