
Usage and Feedback from a 3-Week Launch of a Maternal Health Line for Men in Pakistan

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Abstract

Creating easy access to basic maternal and newborn health information for expectant fathers is likely to improve birth outcomes. We present Super Abbu, a maternal health service that delivers personalized healthcare information and has a discussion forum over an interactive voice response (IVR) system. In its first

21 days, Super Abbu amassed 4,662 users who made 9,424 calls and performed 49,600 actions. Content was listened to 22,878 times, voted on 12,285 times, forwarded 1,737 times and recorded 3,276 times. The majority of users who asked questions (86.6%) were male and the majority of questions were about maternal health (65.1%) followed by questions about child health (12.9%). Super Abbu provides men the opportunity to improve their maternal and child health literacy that may lead to improved birth outcomes.

Author Keywords

mHealth; IVR; maternal and child health; low-literate audience; paternal involvement.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Mobile health, or mHealth, is said to have potential ranging from influencing health behaviors to strengthening health systems [1, 2] with particular interest to low-resource settings [3]. Other mass communication platforms lack several characteristics of mHealth. Television and radio are neither

personalizable nor accessible on demand in most cases. Print media require literacy as does the Internet, the latter demanding access to power, connectivity, and equipment in addition.

Most recent mHealth services aimed at improving maternal, newborn and child health (MNCH) have either targeted frontline health workers or mothers and have varying degrees of impact. For example, the Mobile Alliance for Maternal Action (MAMA) intervention delivered a set of core messages on a pre-defined schedule to expectant mothers over mobile phones to increase health literacy in Bangladesh (known locally as *Aponjon*), India, South Africa, and Nigeria [4]; 64% of *Aponjon* subscribers reported learning that at least 4 antenatal care (ANC) visits were required [5].

mHealth interventions could be beneficial in Pakistan as well where its ranking in the Maternal Mortality Ratio (MMR) has recently slipped from 147th to 149th in the world [6]. However, unlike Pakistan, women have stronger roles than their male counterparts in these countries. Based on a survey of 4,931 married Kenyan women, 74.5% of women view decision-making either as a joint effort between spouses or as the sole responsibility of the woman (excluding how to spend money) [7]. Similar sentiments were held by Tanzanian women in a different study [8]. Married women in Pakistan experience a different household dynamic.

Although mHealth interventions have the potential to empower women through increase in knowledge, decision-making power and access to economic resources [9, 10], some have had harmful consequences by increasing women's risk of domestic violence as the result of their increased autonomy and

decision-making ability [11, 12]. Less than a third of women from several South Asian countries make decisions regarding their health alone [13].

Although paternal involvement during pregnancy positively impacts birth outcomes [15], men in South Asia have little knowledge or experience in maternal health which both frustrates and prevents them from being involved [16]. We have found no studies at the intersection of mHealth and paternal involvement in MNCH in the context of the Global Health.

In Pakistan, men are an ideal target audience for mHealth interventions. Mobile phone penetration is at 79% (149.2 million users) [17]. Because negative birth outcomes primarily affect families in the lowest wealth and literacy quintiles, IVR technology is highly compatible with our target audience of low-income and low-literate men in Lahore. IVRs can be accessed through any type of phone and require low (almost no) literacy or technical skill levels.

We, a group of computer and social scientists at the Computer Science Department at Information Technology University, present Super Abbu ("abbu" is Urdu for "dad"), an IVR that delivers personalized information about MNCH to users for free in the privacy and comfort of their homes. Super Abbu also has a discussion forum for parents on which they may share experiences related to pregnancy and delivery.

Super Abbu: User Interface

Taking into account feedback from pre-pilot tests, we designed the Super Abbu interface to include a personalized question and answer (Q&A) feature along with a story sharing and commenting feature. When a

user dials Super Abbu's number, a caller ringback tone informs them they will receive a call back shortly, after which it disconnects (so the caller is not charged). Super Abbu calls the user back and the service is introduced as one where questions about pregnancy and delivery will be answered and where parents can share their experiences about the same. Then, a disclaimer with instructions on what to do if there is an emergency (hang up and dial 1122, the local 9-1-1) is played. Users are then taken to the main menu (see **Figure 1** for the call tree).

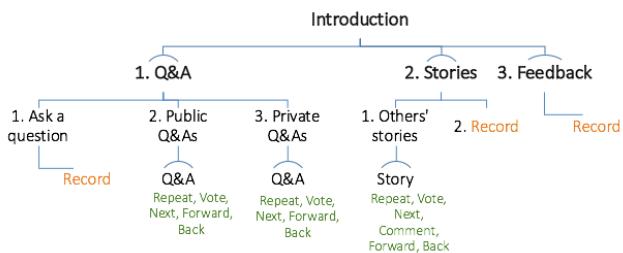


Figure 1. Super Abbu call tree

Main Menu:

Users have the option of choosing option 1: "Q&As from Dr. Saba", where Dr. Saba is a fictional persona, option 2: "other parents' stories about pregnancy and delivery", and option 3: "provide feedback on Super Abbu". We describe each of these options in detail below.

Q&A Menu:

When a user chooses option 1, he is prompted to choose from another list of options: sub-option 1: "ask Dr. Saba a question", sub-option 2: "listen to public Q&As", and sub-option 3: "listen to your own Q&As". Each menu and sub-menu has as its last option "press

to go back to the previous menu" except when a user is asked to vote on content (explained further below).

Q&A sub-option 1: a disclaimer is played requesting that no personally identifiable information be recorded, then the user is prompted to record a question. Upon completing the recording, it is played back to the user, after which he is asked for confirmation ("to approve, press 1, to re-record your question, press 2"). The system prompt informs the user that once Dr. Saba answers his/her question, the system will call back automatically. The user is then asked if he/she would like other users to hear the question by pressing 1 for yes or 2 for no (questions approved by the user may be published on the public Q&A list by the moderator, depending on its cultural appropriateness). The user is then taken back to the previous menu.

Q&A sub-option 2: the public list of Q&As is played in a pre-defined order (the first 10 questions in this list were prepared in consultation with a public health professional and gynecologist based on the most important information a user should hear). 43 Q&As were recycled from previous pilot tests for a total of 53 seeded questions. All subsequent questions are placed in the order they were received, answered and approved by the admin. Original question recordings by users are played whereas only "Dr. Saba" records answers.

After listening to a Q&A, a user must select whether they felt the information was "beneficial", "not beneficial", or "inappropriate" (subsequently referred to as up vote, down vote, and report vote, respectively) before listening to the next question. A user may only vote on a Q&A once. After voting, a user can choose

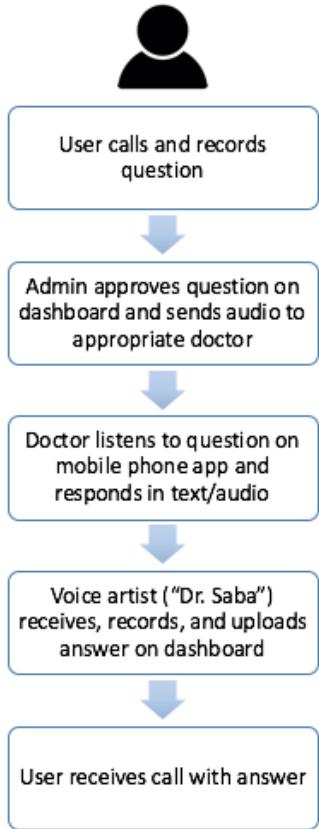


Figure 2. Question flow

from a standard set of options: "repeat", "next", "forward to friends", or "back".

Questions (as with stories) can be forwarded to friends and family by entering their phone numbers. A user is prompted to record his or her own name so the recipient may know who sent the information. When a Q&A is forwarded, the recipient receives a call informing them that the user has sent them information after which the Q&A is played. Recipients are then prompted to enter the service by pressing 1.

Returning users who have already listened to any number of Q&As are given the option of listening to "old" (already listened-to) Q&As or "new" ones. A Q&A is only transferred to a user's "old" Q&A list if a vote has been recorded for that Q&A. This sequence of events applies to both private Q&As and stories.

Q&A sub-option 3: The list of questions that the user has asked along with their answers is played. Voting and the standard set of options are repeated here. If a question has not been answered yet, the user is told that Dr. Saba is busy answering other people's questions.

Stories menu:

When a user chooses option 2, he is prompted to choose from another list of options: sub-option 1: listen to parents' stories about pregnancy and delivery or sub-option 2: record your own story.

Stories sub-option 1: a disclaimer stating that the stories have not been checked for factual accuracy plays and is followed by the first story. Stories play in a

fixed order and are between 2-5 minutes long. 12 stories were seeded and 11 were recycled from previous pilots. Users are prompted to vote on the stories before being able to listen to the next one. Users are able to "comment" on stories and listen to others' comments as well.

Stories sub-option 2: a user is prompted to record a story; recording time is capped at 2 minutes.

Feedback menu:

A user is prompted to record feedback about the service with a maximum recording time of 2 minutes.

Content moderation: Questions

When a question is recorded by a user, an administrator listens to it from a web-based dashboard and selects which type of doctor to send it to (see **Figure 2** for question flow). We created a mobile phone application for doctors where they may listen to and respond to questions either in text or audio format.

A team of 5 gynecologists, pediatricians, and general practitioners have been commissioned and/or volunteer to respond to questions and are requested to do so within 48 hours of receiving them on the mobile application.

Doctors' answers are received on the dashboard, are recorded by a voice artist ("Dr. Saba"), and then uploaded. Uploading the answer pushes a call to the user who asked the question, and their answer is played to them. A user's own Q&As are always available in his/her private Q&A list.

Content moderation: Stories and comments

A user may record a story of up to 2 minutes and a

Overall	
Users	4,662
Calls	9,424
Airtime (minutes)	41,728
Actions	49,600
Action breakdown	
Total listens	22,878
Story listens	10,380
Question listens	12,498
Total votes	12,285
Story votes	4,503
Question votes	7,782
Total attempted recordings	3,276
Questions (approved)	1680 (427)
Stories (approved)	468 (11)
Comments (approved)	221 (27)
Feedback (relevant)	907 (170)
Total forwards	1,737
Story forwards	649
Question forwards	1,088

Table 1. Overall usage of Super Abbu

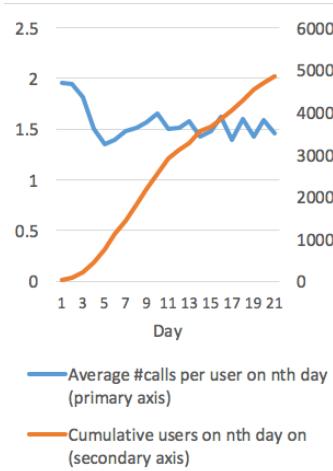


Figure 4. Daily usage per user

comment up to 1 minute in length. The recording is received on our dashboard and a moderator screens it for appropriateness, audibility, and relevance.

Approved stories are added to the list of stories on the IVR in chronological order.

Super Abbu Usage

We present user behavior statistics from the first 3 weeks of the launch. The service was advertised through several means, including flyers, social media, robocalls, and through continuous advertising on an existing, popular entertainment IVR service called Polly [18]. Data on conversion rates from each type of advertising channel will be reported in detail separately. Of the total number of users, 31.2% came from robocalls, 14.8% came from Polly, and the rest from other channels.

In its first 21 days, Super Abbu amassed 4,662 users who made 9,424 calls, consumed 41,782 minutes of airtime and performed 49,600 actions (see **Table 1**). A user action is defined as any of the following: calling Super Abbu, listening to content (stories or questions), voting on content (stories or questions), forwarding content (stories or questions), and recording content (questions, stories, comments, or feedback). Listening to content was the most commonly performed action, with 23 stories being listened to 10,380 times and 480 questions being listened to 12,498 times. On average, each user listened to 20.13 questions and 16.22 stories and forwarded 8.39 questions and 6.63 stories (see **Figure 3**). 1,680 questions recording attempts were made of which 427 (25.4%) were approved and only 11 (2.4%) of recorded stories were approved.

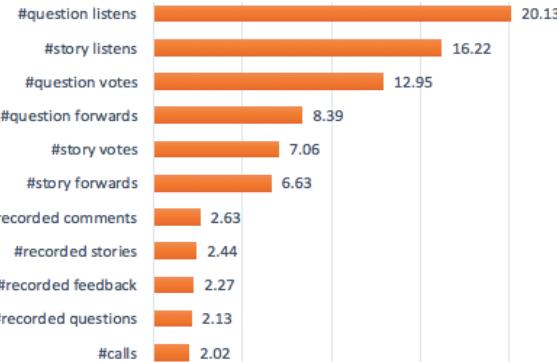


Figure 3. Frequency of actions performed per user

Although the number of users reached nearly 5,000 by the 21st day, the average call per day per user remained between 1.45 to 1.96 times per day (see **Figure 4**). Call traffic on Super Abbu consumed 41,782 minutes costing PKR 63,103 (USD 571). On average, users used the hotline for a total of 9 minutes each.

Feedback & Content Analysis

Q&A votes:

Users found Q&As to be helpful overall (see **Figure 5**). On questions that were voted on at least 20 times, those with the highest percentage of up votes were: (1) "In what month of pregnancy should a woman stop doing household chores? This could be dangerous for both mother and child." (n=135, 84.4%), (2) "When will I feel my baby move in my stomach?" (n=100, 84%) and (3) "Why do doctors advise against traveling during pregnancy? What period during the pregnancy is it safe to travel in?" (n=62, 80.5%). The questions with the highest percentage of negative votes were: (1) "When my wife gets pregnant she gets a bitter taste in her mouth. Why is this so?" (n=15, 33.3%), (2) "My

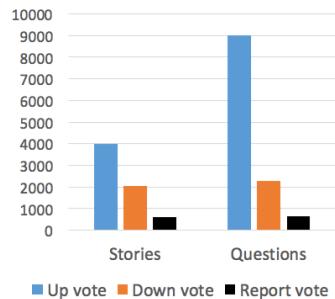


Figure 5. Total user votes on helpfulness (up or down vote) and appropriateness (report vote) on content

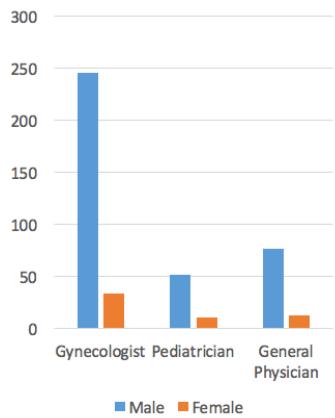


Figure 6. Type of question asked by gender

wife is 5 months pregnant and she sweats a lot. Why is this so?" (n=22, 30.6%) and (3) "How many times should a woman see a doctor during pregnancy?" (n=172, 29.9%). The last question also had the highest percentage of "report" votes (n=88, 15.3%), along with "Why is it important for a pregnant woman to visit a doctor?" (n=50, 12.6%) and "How much calcium should a pregnant woman consume per day?" (n=8, 26.2%).

Q&A Content:

Of the 427 approved questions, 86.6% (n=368) were recorded by men. 65.1% (n=278) of questions were for a gynecologist and 14.3% (n=61) were for a pediatrician (see **Figure 6** for further breakdown). 7.5% (n=32) were about infertility, 6.1% (n=26) were about general pregnancy care and antenatal care visits, 5.6% (n=24) were about birth control and/or birth spacing, 5.6% (n=24) were about diet during pregnancy, 4.2% (n=18) were about breastfeeding and 3.8% (n=16) were about intercourse during pregnancy.

Story votes:

Stories were less well-received in comparison to Q&As (**Figure 5**). On stories that were voted on at least 20 times, those with the highest percentage of up votes were about (1) both parents being equally responsible for raising children and other household chores, and the importance of a pregnant woman having ANC visits and ensuring her comfort and safety throughout the pregnancy, (2) not preferring having a son over a

daughter, the blessings associated with having a daughter, and the importance of praying for a healthy baby irrespective of gender, and (3) a rant about the poor quality of care provided at government hospitals. These first 2 stories were curated and all 3 were recorded by men.

Stories recorded content:

Of the 11 stories that were approved, 3 were about negative birth outcomes (miscarriages and/or stillbirths), 3 were about mistrust of doctors and public hospitals, and 2 were about making children happy and being content with daughters.

Service reception

A majority of the feedback was positive (59%) and constructive (30%). Negative feedback (11%) was based on the inappropriateness of the content on the service and about some users making inappropriate comments.

Next Steps and Expected Contributions

Super Abbu will continue to operate for an additional 300,000 minutes. The data collected during this time will be compiled into a research publication. We would like to scale the service up further, amass over 20,000 users, and then conduct an impact evaluation to determine the benefit users get. We hypothesize that the service will be most impactful in increasing men's health literacy and indirectly improving the health of their respective wives and children.

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