

Pretesting an mHealth Intervention for At-Risk Adolescent Girls in Soweto, South Africa: Studying the Additive Effects of SMSs on Improving Sexual Reproductive Health & Rights Outcomes

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ABSTRACT

Grassroot Soccer (GRS) is exploring the effectiveness of a two-way SMS campaign delivered through a single-sex, soccer-based HIV prevention programme. The campaign aims to enhance reproductive health and rights outcomes among at-risk adolescent South African girls ages 11-14. To test and refine the SMS campaign prior to piloting, GRS employed a participatory process in building a prototype of an Unstructured Supplementary Service Data (USSD) line using Open Data Kit (ODK), an open-source application for building, collecting, and managing data on Android-enabled phones and tablets. The USSD prototype was delivered to 72 female participants and coaches in July 2013. All participants also completed a 10-item questionnaire on ODK. Focus group discussions were conducted with coaches (N=1 group) and parents (N=1 group). Results demonstrate that 55% of participants reported owning a mobile phone; a majority reported being “very interested” in the USSD prototype (68%) and “very comfortable” interacting with the USSD prototype (62%). Findings suggest that two-way SMSs could offer an acceptable service for reaching at-risk adolescent girls in South Africa with health-related messaging, particularly on sensitive issues. Results will inform delivery of a USSD line in a programmatic pilot and assessment to be carried out in six primary schools (approximately 600 participants) in Soweto, separated between control and intervention groups, beginning in September 2013.

Categories and Subject Descriptors

D.3.2, I.7.2

General Terms

Measurement, Documentation, Performance, Design, Reliability, Experimentation, Human Factors

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Keywords

HIV prevention, USSD, mobile data collection, sexual reproductive health and rights, Open Data Kit.

1 INTRODUCTION

Using mobile technology—termed “mHealth”—interventions for HIV/AIDS and STI-related health promotion is well documented in the literature, but few studies provide evidence of the impact of such programmes on behaviour change [1]. A 2009 systematic review found 25 studies in 13 countries that met inclusion criteria. Most studies included one-way “push” messages and assessed disease management outcomes [2].

Through a participatory process, Grassroot Soccer (GRS) in partnership with the Praekelt Foundation and Western Cape Labs is designing a two-way SMS campaign to be delivered through a single-sex, soccer-based HIV prevention programme. The SMS campaign, named *Coach Tumi*, is being built on an Unstructured Supplementary Service Data (USSD) line. A USSD line is a menu of options that facilitates a conversation about a service between a person and a phone and can be provided at no cost for the user.

Coach Tumi aims to enhance reproductive health and rights outcomes among at-risk adolescent South African girls ages 11-14. Specifically, the purpose of the campaign is to: a) keep participants engaged with important discussions during and after the intervention by connecting with SMSs on a weekly basis; b) increase participants’ uptake of sexual reproductive health and rights services in their communities; and, c) reach participants regardless of whether or not they own mobile phones. The all-girls programme, *SKILLZ Street*, and added SMS campaign will be piloted over six-months and evaluated through a programmatic assessment from September through December 2013.

To explore the design requirements and content for *Coach Tumi*, GRS developed a prototype USSD line using Open Data Kit (ODK), an open-source application for building, collecting, and managing data using Android-enabled phones and tablets. The prototype was tested and feedback was gathered over five days with *SKILLZ Street* participants in Soweto, South Africa. Participants’ interaction on ODK was tracked in real time and evaluated through questionnaires, focus group discussions, and observation.

In this paper, we discuss the process through which the ODK USSD line prototype was conceptualized, built, and delivered. We

present results from the prototype delivery and ways in which the results were used to inform design of the pilot *Coach Tumi* SMS campaign, to be launched in September 2013.

2 BACKGROUND

Literature suggests that mobile phones offer an effective means of communicating with people of different socioeconomic backgrounds in South Africa. Recent mobile phone research in South Africa shows that 72% of 15-24 year olds living in urban areas own mobile phones. Ownership of mobile phones in South Africa has increased an average of 20% from 2005 to 2009, with a mobile phone penetration of 100.5% by 2010 [3].

In recent years, mHealth interventions have become a popular platform to connect with health care consumers. Sending SMSs or text messages to monitor and/or support health care consumers in managing their diseases is an increasingly valuable supplement to pre-existing health programming. For example, a trial in Kenya demonstrated reductions in viral load through an intervention using SMSs to support patients with disease management. However, there remains the need to further explore the effectiveness of SMSs on increased uptake of services and increased healthy behaviour, especially in low-income countries [4].

Targeting ages 11-14, GRS' *SKILLZ Street* programme aims to: a) empower girls to make informed, autonomous sexual choices; b) build self-esteem and self-confidence through skills development and intimate conversations with powerful female role models; and, c) increase access to and uptake of services, including voluntary HIV counseling and testing (HCT), HIV and sexually transmitted infection (STI) treatment, contraception and unplanned pregnancy care, and medical, social and legal support for violence against women. The programme provides a unique platform for exploring the effects of a supplementary SMS campaign on reproductive rights and health outcomes among adolescent girls in South Africa.

3 METHODOLOGY

The *Coach Tumi* prototype was delivered to 72 female participants and coaches at a five-day *SKILLZ Street* Holiday camp in Soweto, South Africa. All 72 participants and coaches completed a 10-item questionnaire, also built in ODK and delivered on Android-enabled phones. The questionnaire examined: current mobile phone and social media usage and acceptability of the USSD prototype. Questionnaire results were analyzed using *ODK aggregate*, an online platform for analyzing and managing data.

Focus group discussions (FGDs) were conducted with coaches (N=1 group) and parents (N=1 group) to explore: the role of the *SKILLZ Street* coach in participants' lives; perceived impact of the *Coach Tumi* prototype messaging; availability of local services in the community; and acceptability of the prototype. Discussions were transcribed and analyzed for emerging themes. Participant observation was carried out by five GRS team members during the *SKILLZ Street* camp.

4 PROTOTYPE DESIGN & PRE-TESTING

GRS built the *Coach Tumi* prototype on Open Data Kit (ODK) to replicate the functions and processes of an actual USSD line, which facilitates a time-sensitive conversation (between 90 and 180-seconds, maximum) through a menu of options. The *SKILLZ*

Street participants were involved in the prototyping process to ensure the USSD line is designed by girls, for girls, and uses language and content that resonates with them.

4.1 Conceptualizing

Using primary and secondary research, GRS explored and tested assumptions about adolescent girls' sexual reproductive health and rights. In a cluster-randomized controlled trial evaluating a Grassroot Soccer program delivered to secondary school learners in South Africa, 368 female learners (29.8%) reported having ever experienced physical intimate partner violence [5]. Recent HIV research in South Africa has shown that women who have experienced intimate partner violence have a 50% increased risk of HIV acquisition and commonly experience psychological distress that leads to increased risky sexual behaviour [6]. Furthermore, adolescent girls have low access to family planning services due to distrust of health care workers, inadequate services provided by health care workers, and limited knowledge of reproductive health rights [7].

In addition to relevant content from the literature, GRS drew from internal research in conceptualizing the pilot programme and content of the prototype. FGDs conducted with *SKILLZ Street* participants in 2012 (N=5 groups) highlighted a desire among participants to learn about the female body—specifically, menstruation and pregnancy. Participants also desired positive female role models to discuss girl-specific issues that they felt uncomfortable discussing elsewhere. For example: "Not any adult will talk, will discuss things that we discuss in *SKILLZ [Street]* with girls" (Participant FGD, 2012). These findings point to the importance of informing adolescent girls about sexual reproductive health rights and connecting adolescent girls with adequate family planning and sexual violence services and information.

Previous research on GRS programmes further informed the decision to employ ODK software in the prototyping process. In two sexual behavior surveys administered through ODK, 4015 (78.1%) of participants reported preferring the mobile-phone-based survey to a pen-and-paper survey [8].

4.2 Building

Based on primary and secondary research consulted, GRS identified four topics to present as the main menu of options for the *Coach Tumi* prototype:

1. I need help right now
2. My body
3. My relationships
4. Young female leaders

The prototype was built on Open Data Kit (ODK). ODK enables complex skip patterns, multi-language implementation, multimedia, collection of GPS coordinates, and secure web-based data storage. After selecting one of the four topics presented in the main menu, participants navigated the prototype by swiping (using the Android-based phone capability) from one screen to the next. Each topic chosen presented between three and five prompts, specifying the type of services required regarding sexual reproductive health and rights. All four topics led to a final message offering an SMS with information on accessing further support.

Coach Tumi was selected as the name for the campaign to build on a key component of the *SKILLZ Street* programme: generating

trust between a participant and her coach. The name is intended to increase participants' level of comfort with the SMS service through use of a "coach" character as a guide.

Figure 1 presents a sample sequence of options a participant could select while interacting with the prototype—in this case, when selecting "I need help right now" from the main menu.

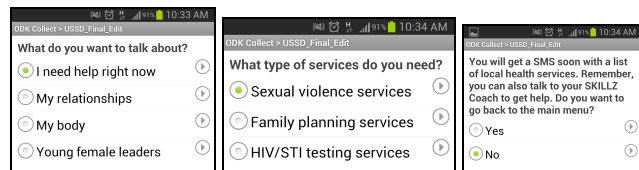


Figure 1. Coach Tumi prototype sample sequence

4.3 Delivery of Prototype

Each of the 72 *SKILLZ Street* Holiday camp participants and coaches was provided with an Android-enabled phone and asked to go through the prototype USSD line up to three times to become familiar with the menu of options and the content. Sessions were limited to three minutes to mimic the maximum time of an actual USSD line.

During the prototyping delivery, participants were informed that their interaction with ODK constituted a test process and that they would not receive an SMS. However, they were encouraged to approach their female coach or a GRS staff member should they require support. Several participants did disclose and were referred to the Thuthuzela Care Centre—a GRS referral partner—for immediate care and treatment.

Figure 2 presents the overall sequence in development of the prototype and pilot.

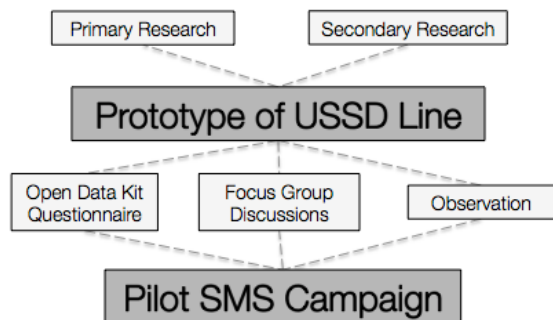


Figure 2. Development of prototype and pilot

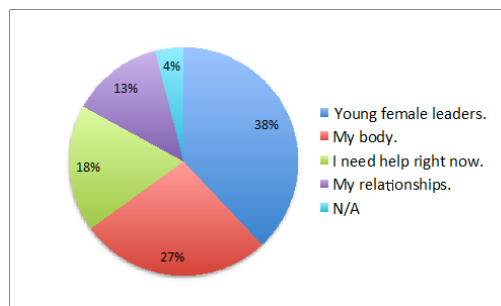
4.4 Findings

ODK questionnaire findings demonstrate that 55% of those surveyed reported owning a mobile phone; 85% of those surveyed reported that someone in their household owns a mobile phone, of which 48% said they could access the mobile phone in their household. A majority of participants were interested in and comfortable maneuvering through the *Coach Tumi* prototype: on a four-point likert scale, 68% of girls reported being "very interested" in the prototype and 62% of girls reported feeling "very comfortable" while navigating through the *Coach Tumi* prototype.

On their first round of navigation through the *Coach Tumi* prototype, 38% of participants selected "Young female leaders"

from the main menu; 27% selected "My body;" 18% selected "I need help right now;" and 13% selected "My relationships" (see Table 1).

Table 1. Coach Tumi prototype main menu interaction



FGD participants believed that the *Coach Tumi* prototype could provide a promising way to engage youth with knowledge and information about local sexual reproductive health and rights services in a private environment.

"...knowing that no one will judge you [about going to the clinic]. No one will ask you why you are there or ask you why you need the information. We can say, 'I need the information for my own uses.' I will be the only one reading about it [on my phone]."

According to coaches, the USSD model offers girls a safe space to ask private questions about their sexual reproductive health and rights outside of *SKILLZ Street*: "[The participants] say that [the SMS campaign] would be much more easier for them to actually ask questions... 'maybe my coach isn't here so I would do that through USSD.'" Additionally, coaches felt that the topics presented in the main menu are consistent with key messages within the *SKILLZ Street* curriculum and are appropriate for girls age 11-14.

FGD participants made several recommendations for the further development of the *Coach Tumi* campaign. They emphasized the importance of understanding and connecting participants with youth-friendly local clinics that are known to provide adequate services: "...before you go *SKILLZ Street*, you brief the ladies: 'Ladies, these are the services this community actually offers.'" Other participants recommended that GRS should explore additional messaging about the importance of advocating for oneself at clinics.

"I think we should actually educate kids about [their rights]. 'Cause there are some nurses who are actually quite rude, and when you are about to go for parent planning, if you are young...they even ask you, 'What are you here for? Because you're still a kid!' They are already depriving the right that I have to health services."

Finally, participants suggested integrating a game component to keep participants engaged after their first interaction with the *Coach Tumi* campaign.

5 CONCLUSION

Results from the *Coach Tumi* prototype suggest that a USSD line offers a promising means of reaching adolescent girls ages 11-14 with important messages pertaining to sensitive health issues and access of services. A slight majority of participants reported owning a mobile phone, with a higher percentage reporting that someone in their household owned a mobile phone. This finding

reinforces the benefit of the USSD line in allowing a girl to access the messages on *any* phone—not only a phone belonging to her. Interest in and acceptability of the prototype among participants was above 60%. FGDs reinforced findings, with coaches and participants also noting the added degree of privacy afforded by a USSD line. These results provide justification for delivery of the *Coach Tumi* USSD line during the pilot programme and assessment, beginning in September 2013.

Findings from the prototype informed refinement of the USSD line prior to delivery of the pilot programme. GRS identified and connected with youth-friendly local clinics, building relationships deemed essential to the delivery of the programme—particularly given that 18% of participants selected the “I need help right now” option on the main menu of the USSD line prototype. Based on participants’ desires for a “game,” content for the USSD line was designed using a quiz format (see Figure 3). The quiz content built on the structure of the curriculum to reinforce key messages and sexual reproductive health and rights knowledge.

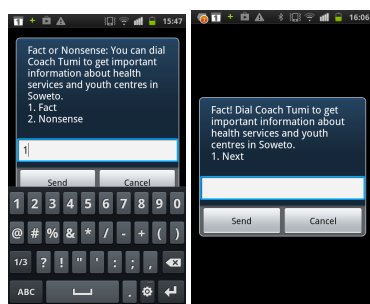


Figure 3. Pilot *Coach Tumi* campaign: quiz sample screen

Grassroot Soccer developed a partnership with the Praekelt Foundation and Western Cape Labs to build the USSD line for the pilot programme on Praekelt’s Vumi Go platform. The system allows for the team to dynamically control the content participants receive, while aggregating all interactions from participants and storing data for analysis.

The pilot programme and assessment will provide insight into the impact of a supplemental (deployed in conjunction with a face-to-face intervention) two-way SMS campaign on self-reported access to local health services and sexual reproductive health and rights knowledge among participants. It will involve six schools in Soweto (approximately 600 adolescent girls), separated between control and intervention groups. ODK questionnaires and focus group discussions will be administered to evaluate the

effectiveness of the pilot programme and added SMS campaign. Should the pilot programme and assessment show promising results, GRS plans to implement and more rigorously evaluate a larger-scale SMS campaign in 2014.

6 ACKNOWLEDGMENTS

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