Using Interactive Voice Response to Reach Young People with SRHR Information

Rapid Pilot Evaluation of an IVR Game in Lagos, Nigeria

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Grassroot Soccer conducted a rapid pilot evaluation of an interactive voice response (IVR) game with young people in Lagos, Nigeria, aiming to examine the effectiveness of the 3-2-1 SKILLZ Wanji game at improving SRHR knowledge among young people aged 15-24, examine the acceptability of the game, and explore the game as a supplemental tool for in-person intervention participants. Participants new to SKILLZ, who had never attended in-person programming, completed a short survey immediately before and after engaging with the 3-2-1 SKILLZ Wanji game (n=40) and a subset of participants took part in three focus group discussions. Quantitative pre/post results indicate that the once-off game intervention was somewhat effective in improving SKILLZ-naive participant SRHR knowledge, with an overall 13% change on knowledge items. Qualitative feedback was generally positive: participants enjoyed the 3-2-1 SKILLZ Wanji game format and content, and found the material to be informative and interesting. Despite largely enjoying the game once connected, participants identified several barriers that could prevent other young people from accessing the game outside the evaluation/research context. The IVR platform and game format appears promising to reach a wide audience of young people with critical SRHR information.

CCS CONCEPTS • **Human-centered computing~Human computer interaction (HCI)~HCI design and evaluation methods~Field studies • Human-centered computing~Ubiquitous and mobile computing~Ubiquitous and mobile devices ~Mobile phones •**

Additional Keywords and Phrases: Adolescent sexual and reproductive health, interactive voice response, gamification, comprehensive sexuality education

1 INTRODUCTION

Limitations on in-person gatherings due to COVID-19 have pushed health organizations to consider innovative approaches for reaching beneficiaries with critical health information, including mobile phone-based programming. Grassroot Soccer (GRS), a sport-based adolescent health organization, partnered with Viamo beginning in 2020 to adapt content from in-person health curricula for an interactive voice response (IVR) game on the 3-2-1 platform in Nigeria.

Since 2002, GRS has used soccer language, metaphors, and activities to deliver critical sexual and reproductive health and rights (SRHR) information and link adolescents to health services. Typical in-person programming is delivered by a 'Coach' trained in youth facilitation skills, who also acts as a positive role model for young people from the community. Interventions are centered around an interactive, evidence-based curriculum known as 'SKILLZ,' which is based on positive youth development principles and includes content on puberty, contraception, HIV prevention, gender equality, and healthy relationships, among other topics [1]. In-person SKILLZ programming is usually delivered at schools, health facilities, and community venues. Viamo, a global social enterprise organization, is a leader in using IVR to reach end users in low- and middle-income countries. The 3-2-1 IVR platform allows users to dial in and access public service information in the local language at any time, free of charge for subscribers to certain mobile providers [5].

GRS and Viamo selected key concepts from existing SKILLZ curricula and created a script that maintains the fun culture of sport-based programming in a user-friendly interactive game. The game is built on the Wanji Games platform, an interactive approach that uses basic telephony to reach audiences while addressing challenges of literacy [3]. The 3-2-1 SKILLZ Wanji game allows users to direct their own experience, choosing a path through the content by selecting responses on the phone keypad. Voice actors, music, and sound effects add to the experience. The 3-2-1 SKILLZ Wanji game has reached 17,541 users in 6 regions of Nigeria since its debut in May 2021. GRS undertook a rapid, low-cost pilot evaluation of the game from September to October 2021, aiming to assess the effectiveness and acceptability of the 3-2-1 SKILLZ Game among young people (aged 15-24 years) in Lagos, Nigeria. The specific objectives of the pilot evaluation were:

1. To determine the change in SRH-related knowledge among young people aged 15 – 24 years in Lagos, Nigeria following engagement with the 3-2-1 SKILLZ game.
2. To explore the perception and experiences of 3-2-1 SKILLZ game users.

2 BACKGROUND

Mobile phone interventions have been used increasingly to address barriers of traditional broadcast mediums, such as requiring access to a TV or radio, or tuning in at a specific time. There are now more mobile phone subscriptions than people worldwide [3], and mobile phones are extremely convenient to reach mass audiences. In Nigeria, there are about 170 million mobile subscribers, and the mobile phone penetration rate is 89%, with 27% owning smart phones, and 62% owning standard cell phones [4].

Viamo's 3-2-1 service operates through regular voice calling, and currently operates in 19 countries. In Nigeria, the 3-2-1 service hosts content on 7 thematic areas, including health, agriculture, weather, news, education, and good governance, and corporate partnership allows Airtel users to access the service for free, providing cost-effective reach to millions. Viamo collects data through each module on the platform, showing user choices in the IVR Wanji games. Optional registration for each unique phone number accessing the service also allows collection of user demographic data.

3 METHODS

This rapid pilot evaluation used a mixed methods design, with two groups of participants: SKILLZ curriculum-experienced and SKILLZ curriculum-naive. The SKILLZ-experienced group included young people who had previously participated in in-person programming with GRS Coaches. The SKILLZ-naive group had previously never participated in GRS SKILLZ programming, and the 3-2-1 game was their first exposure to GRS SKILLZ.

Ethical approval for this pilot evaluation was obtained from the Lagos University Teaching Hospital Health Research Ethics Committee. Participants provided written informed consent/assent, and written parental consent was collected where needed. Data collection took place in a seminar room at the University of Lagos, and COVID-19 prevention protocols were strictly followed.

3.1 Quantitative Methods

SKILLZ-naive participants were recruited from two urban local government areas (LGAs), Mushin and Lagos Mainland. Recruitment was carried out with existing youth structures within the LGAs, the Lagos State Youth Ambassadors and the Health Educator working with the LGA. For the SKILLZ-experienced group, participants were recruited by SKILLZ Coaches from Araromi Youth Centre in Kosofe local government area.

SKILLZ-naive participants completed a brief socio-demographic form and written pre-test questionnaire, then were provided mobile credit and guided through the 3-2-1 SKILLZ game using a mobile phone. An information leaflet on the game was provided, and research assistants were present to address any questions or difficulties. Following the game, participants completed a written post-test. The pre/post questionnaire contained 10 knowledge and attitudinal items that the game user answered by ticking agree or disagree. The percentage of participants answering each item correctly on the pre-test was compared to the percentage answering each item correctly on the post-test, after engaging with the game. Percentage change on each item is the primary outcome reported below.

3.2 Qualitative Methods

A subset of the SKILLZ-naive participants was selected to participate in the focus group discussions (FGDs). Two groups of 10 young people split by age group (15 – 19 years and 20+) were engaged in semi-structured focus group discussions to explore their perceptions and experiences with the 3-2-1 SKILLZ Wanji game. One group of 11 SKILLZ-experienced participants young people were engaged in a focus group discussion. Each FGD was recorded and subsequently transcribed. Transcripts were analyzed using a thematic analysis approach [2].

4 RESULTS

4.1 Participant Characteristics

Of 40 SKILLZ-naive participants who completed the pre/post questionnaire, the mean age was 18.9 years (range 15-24), gender was split 45% female (n=18) vs 55% male (n=22), and 40% of participants reported Senior Secondary School as their highest level of education. Twenty of these young people were included in two FGDs: 10 were female, 10 were male, and they ranged in age from 17 to 21 years old. In the FGD for SKILLZ-experienced participants, a total of eleven participants took part, including four males and seven females. Participant ages ranged from 16-19 years.

4.2 Quantitative Results

Pre/post questionnaire results show positive changes in participant SRHR knowledge and attitudes, with more encouraging results around knowledge. Results are shown in Table 1 below, showing each statement, the percentage of participants who answered correctly at pre-test and post-test, and the calculated % change. The overall results are reported, as well as by gender.

Table 1: Pre- and post-test results

Statement	Group	Pre	Post	% Change
1. Condoms are the only contraceptive method that protect against pregnancy as well as STIs and HIV	Overall	65%	80%	23%
	Female	44%	72%	63%
	Male	73%	86%	19%
2. I know where to go if I have questions about the changes that are happening in my body	Overall	90%	98%	8%
	Female	89%	100%	13%
	Male	91%	95%	5%
3. If a person wants to have sex, that person should speak with their partner about using a condom	Overall	90%	100%	11%
	Female	78%	100%	29%
	Male	100%	100%	0%
4. Boys and men should share all household chores, such as cooking and fetching water.	Overall	70%	65%	-7%
	Female	67%	72%	8%
	Male	73%	59%	-19%
5. It is a man's responsibility to make decisions in a relationship[a]	Overall	38%	45%	20%
	Female	61%	67%	9%
	Male	14%	23%	67%
6. I can make the choice to have sex and protect myself from STIs, HIV and/or unwanted pregnancy	Overall	90%	88%	-3%
	Female	83%	78%	-7%
	Male	95%	95%	0%
7. I have the right to say no to sex, no matter who asks me	Overall	93%	95%	3%
	Female	94%	94%	0%
	Male	91%	95%	5%
8. It is okay for a man to hit his girlfriend[a]	Overall	93%	95%	3%
	Female	94%	100%	6%
	Male	91%	91%	0%
9. I am ready to take an HIV test	Overall	83%	85%	3%
	Female	100%	94%	-6%
	Male	68%	77%	13%
10. I am comfortable talking to my boyfriend/girlfriend about our sexual relationship	Overall	88%	93%	6%
	Female	72%	83%	15%
	Male	100%	100%	0%
Overall	Overall	80%	84%	5%
	Female	78%	86%	10%
	Male	80%	82%	2%

[a] On these negatively-worded items, the more gender-equitable response is 'disagree'

An overall 5% increase from pre- to post-test is encouraging for a short, once-off intervention. The average pre-test proportion of participants answering correctly was 80%, which is relatively high, and indicating that the material in the game may not be new to young people in Lagos. Participants showed more improvement in knowledge (13%), measured by items 1, 2, and 3, compared to attitudes as measured in items 4-10 (2%).

Girls started with a lower baseline value and demonstrated a greater percent change on 7 of the 10 pre/post items. For example, large pre/post improvement was observed on item 1 related to knowledge of condoms offering dual protection

from pregnancy and STIs for both female and male participants (63% change and 19%, respectively), but the starting value for female participants was only 44% compared to 73% for boys.

4.3 Qualitative Results

4.3.1Acceptability

Overall, participants enjoyed the 3-2-1 SKILLZ Wanji game format and content, and found the material to be informative and interesting. The IVR format was new to all participants. Participants used the following terms to describe the 3-2-1 SKILLZ game: fun; enjoyable; exciting; interesting; important; cool; and impactful: "I can say the game was totally fun, and em it enlightens us about ourselves mostly and how we are going to live more by taking our relationship life and should I say sexual life also I can say it is also very good for us teenagers and youths it consist everybody." (Non-SKILLZ participant, Mushin LGA, 19 years old, male)

Participants reported that the game provided important SRHR information including HIV prevention, contraceptives, healthy relationships: "I learnt about puberty also and then sexual all this stuff... I really appreciate…I learnt that it is good to use protection when having sex and it is good to do a test maybe boyfriend & girlfriend husband & wife it is necessary to do a test before having any relationship or stuffs." (Non-SKILLZ participant, Lagos Mainland LGA, 19 years old, male)

Participants liked the innovative format used for delivering information and teaching the topics. Most enjoyed the sound effects and voiceover, and highlighted these as effective tools to emphasize points and correct vs. incorrect responses in the game:

> "There is some parts that they asked question, the question is like yes/no but they used some fun ways to ask it for people to have interest in it and make it better so the information they used is OK. It's like if you choose the correct answer they play a ball - goal as if you won that is the yes part and the other part it's just like another slang that means no." (Non-SKILLZ participant, Lagos Mainland LGA, 19 years old, male)

Participants/players enjoyed that they had control over the extent/duration to which they wanted to play the game:

> "…the way we answer questions how they will ask if we want continuation or if we want them to stop the game at that point. (Mixture of English and native language) third one I like is that once you press continuation they will continue the story from where it stopped eg if they say press one to continue press 3 to stop there it will stop by itself." (Non-SKILLZ participant, Lagos Mainland LGA, 19 years old, male)

Additionally, nearly all participants said that they knew others who would also enjoy playing it. These largely included siblings and friends, as well as classmates, colleagues, and in one case, a faith leader.

4.3.2Comparison to in-person SKILLZ programming

Comparing the 3-2-1 SKILLZ Wanji game to the in-person SKILLZ intervention with a Coach, all but one participant preferred the in-person intervention. SKILLZ participants highlighted the importance of the Coach in the in-person intervention, noting that their Coach made a big difference to their learning experiences: "The training with my coach was more interesting because it was a lively game and we usually play games." (SKILLZ-experienced participant, Kosofe LGA, 17 years old, female) Regarding content, SKILLZ participants noted that they had mostly learned about the content in the 3-2-1 game during their SKILLZ sessions: "All the things I heard I have learnt during SKILLZ." (SKILLZ-

experienced participant, Kosofe LGA, 19 years old, male). Only one participant said that they did not learn much about puberty during in-person SKILLZ sessions, but that it was covered in the 3-2-1 game.

4.3.3Challenges and Barriers to Access

Despite largely enjoying the game once connected, participants identified numerous barriers that could prevent other young people from accessing the game outside the evaluation/research context. Many participants reported difficulty connecting to the 3-2-1 service, and several players complained that they dialed several times before connecting to the platform, or experienced network challenges: "…it got to a point where it will start breaking then it will come back again but I think they should work on the network issue I think it was network crashing/jamming on each other so it will flow well." (SKILLZ experienced participant, Kosofe LGA, 19 years old, male)

Participants also highlighted the cost of calling as a barrier, as not all of them use Airtel as a provider. Additionally, many players disliked the length of time it took to play the game, noting that it took too long: "The time duration is too long. Not all youths are able to sit down and listen to a game for 25 minutes upwards." (SKILLZ-experienced participant, Kosofe LGA, 19 years old, female)

Finally, participants described mixed experiences in navigating to the SKILLZ game on the 3-2-1 platform: some said that it was easy, while for others it was difficult and described as challenging and frustrating. Some participants also reported that the voice speaking on the game fluctuated from being very loud to very low and barely audible.

4.3.4Recommendations for improvement

Participants recommended a number of changes to improve the experience of using the 3-2-1 SKILLZ Wanji game. In order to improve access to the game, participants recommended that it should be free on all mobile networks: "They should make it free for all the other network so that it will be easy for those of us using another SIM apart from Airtel that... because it is hard for some of us to buy cards. If they made it for all of us to be using it for free it will be better like that." (Non-SKILLZ participant, Mushin LGA, 19 years old, male) Participants also recommended that the platform should be able to store previous engagement to help conserve airtime credit, and that there should be a way to navigate directly to specific content in the game.

Some SKILLZ participants recommended that the game content be put into an app to replace or in addition to the IVR service. Some indicated they would prefer receiving messages with the SKILLZ content: "I think I go with the app. It can also be like in a [USSD] dialing code, it can also come inform of messages." (SKILLZ-experienced participant, Kosofe LGA, 17 years old, female) Finally, some participants suggested that the content around contraceptives and family planning be modified, while others wanted to see additional information around menstruation and HIV testing.

5 DISCUSSION & CONCLUSIONS

Overall, this rapid pilot evaluation indicates that the 3-2-1 SKILLZ Wanji game is a potentially promising tool for reaching adolescents and young people with critical health information in an entertaining manner. Quantitative pre/post results, though limited by a small sample size, indicate that the game is moderately effective in improving participant knowledge, with an overall pre/post improvement of 13% on SRHR knowledge statements. For all but 3 items on the pre/post questionnaire, female participants had lower starting values than male participants, so they had more room for improvement. Less positive change was observed on items related to attitudes, which not unexpected from a once-off, short intervention such as the 3-2-1 SKILLZ Wanji game.

Qualitative feedback indicates that both SKILLZ-naive and SKILLZ-experienced participants thought the game was fun, enjoyable, and entertaining, as well as informative. Many of the SKILLZ-experienced participants noted that they had learned about most of the content in SKILLZ sessions with their Coach, but that they would still recommend it to other participants. All participants in both groups indicated that they knew other young people who would like to play.

Most recommendations and areas for improvement noted in focus group discussions were around connecting to the game itself, network difficulties, and similar challenges. SKILLZ-naive participants also largely reported that the cost to access the game would be a barrier, and recommended that it be free for all mobile providers to access. Participants also reported that the game took too much time, and that if they had been playing on their own, they would have not gone through the whole thing in one sitting.

Data from this rapid pilot evaluation indicate that the 3-2-1 platform is a promising way to reach young people in Nigeria with health content, and the game format of the SKILLZ Wanji game was well-enjoyed. Health organizations in low- and middle-income countries should further explore IVR games to reach adolescents, particularly in periods of limited in-person programming or as a supplemental resource to existing in-person activities for continued learning at scale.

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