Efficacy of mobile serious games in increasing HIV risk perception in Swaziland: A Randomized Control Trial (SGprev Trial)

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Background: It is estimated that 35.3 million people are living with human immunodeficiency virus (HIV) globally [1]. Sub-Saharan African (SSA) is the most affected region and the disease burden varies considerably between countries. In Swaziland, a land-locked, lower-middle income country surrounded by South Africa and Mozambique, HIV prevalence is estimated to be 26% among men and women of 15-49 years [2]. HIV is the leading public health concern in Swaziland. National efforts have emphasized the scale-up of a combination of prevention approaches including: HIV testing and counseling, social behavior change communication, medical male circumcision, and HIV care and antiretroviral services. Despite this cocktail of prevention approaches, risky behaviors remain high. The extended National Strategic Framework for 2014-2018 points out that the Swaziland Social and Behavior Change strategy has had limited success in facilitating desired levels of behavior change especially personal HIV risk perception [3]. Beliefs about personal risk of HIV infection are central to motivate people to engage in behaviors that reduce their risk of HIV infection [4]. Models such as the Protection Motivation Theory and the Health Belief Model offer insights into the significance of perceived risk in adopting protective behavior. To date, there has been limited randomized control trials aimed at influencing how people perceived their risk of HIV in Swaziland. Furthermore, anecdotal information suggests that there is information fatigue from the target audience in receiving HIV prevention messages from the mass media. One strategy that can break this perceived fatigue is the use of target audiences' mobile phones. In developing countries, decreasing costs and increasing mobile network coverage provide a wide range of opportunities for health apps using mobile phones [5]. Although comprehensive up to date data for mobile phone usage in Swaziland is limited, mobile phone penetration is estimated at 87%. Our consultative meeting with the only mobile carrier in Swaziland revealed that there are currently 206,880 smartphones on the mobile network (as of June 2015). Therefore, our study seeks to use serious games delivered via mobile smartphones to engage the target audience in creative ways to increase personalization of HIV risk.

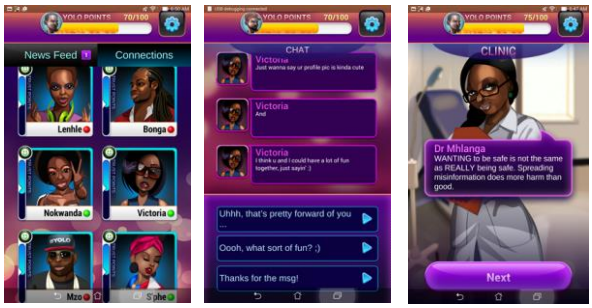
Methods: The Swaziland Serious Games–Based HIV Prevention Trial (SGprev trial) is a 4-week, two-arm randomized controlled trial. Participants were randomized into two groups (the intervention group and a wait-list control group) in a 1:1 allocation ratio. The intervention was downloadable from our website, on the Google Play store, and in popular cellular shops around Swaziland. We plan to test whether a serious game intervention delivered on mobile phones to 1) increase HIV risk perception, 2) increases the intention to reduce multiple sexual partnerships, 3) intention to know own HIV status, and 4) intention to know all sexual partners' HIV status will be more effective compared with current prevention efforts.
Our target population is Swazi males and females between 18- to 29-years old currently in Swaziland. We estimated our sample size as 380 of equal gender distribution. Statistical analysis will be conducted using two-sample generalization McNemar's test and multiple logistic regression.

Intervention description: SwaziYolo (a smartphone game) is an interactive, educational story game that puts the player in the role of a young adult looking for love in Swaziland, making important choices about relationships and sexual health. The intervention capitalizes on elements of serious games such as

immersion, role-playing, and a dynamic storyline. The game exists in two major parts: the first is set in an imaginary social network called SwaziYolo. Here, players register, view pictures of potential love interests (Figure 1 "Connections" screen) and have Web-based chats (Figure 1 chat mode screen) with various characters. The other half of the game takes place in various made-up locations around Swaziland, such as nightclubs and cafes where players regularly go on dates referred to in the game as "meet-ups." In both parts of the game, players are regularly required to choose between several courses of action to progress a conversation or storyline with a friend or love interest (Figure 1 chat mode screen). The decisions they make will influence the opinions and behavior of other characters, as well as the player's own health. Eventually, feedback is given based on choices made (Figure 1 feedback from a medical doctor at a clinic screen). In the game, the various character dialogues and scenes, will address the issues identified in our formative research such as HIV risk perception, raising knowledge of their own HIV status as well as a sexual partner's HIV status, reducing multiple concurrent sexual partnerships, and consistent condom use.

The goal of the game is to maintain relationships with the characters, while staying healthy and happy. The game is expected to have an immense appeal to the youth, as an exciting new way to use their smartphones.

Figure 1. Shows SwaziYolo screenshots



Connections screen　Chat mode screen　Feedback screen

Game Play

Player's curiosity to "know what happens when they make a choice" is key to user engagement. The game's narrative is primarily concerned with matters of sexual health, especially as it relates to HIV. Players will usually find themselves in situations where they have to make important decisions about their health, for example, resisting the pressure to have unprotected sex. The game keeps track of how well a player's relationship is going with other characters using "Intimacy" ratings, and "YOLO" ratings: how safe (safe relates to making choices that do not expose player to HIV risk) they have been during the course of the game. While players enjoy game play, they are exposed to valuable learning situations and are encouraged to care more about the various characters. Some will give good advice, while others will find themselves in difficult situations where they ask other players for help and guidance.

Results: As of June 26, 2017, 887 people were screened for eligibility and 90.1% (799/887) were eligible. Of those, 380 participants were recruited, randomized and took baseline survey. About 55% (104/190) of the intervention group has received the intervention. From all study arms, 17.4% (66/380) have taken the follow up survey. Statistical analysis is expected in August 2017.

Trial implications

In line with the guidance form UNAIDS, this trial will provide a robust and rigorous evaluation of the efficacy of mobile serious games in increasing HIV risk perception in a resource limited setting such as Swaziland. Findings from this study will be made available to Swaziland authorities and stakeholders working to improve HIV prevention in Swaziland. We envision that the results of this study will be highly relevant to other SSA countries and will inform future innovative strategies for HIV prevention. To our knowledge this is the first randomized control trial of a mobile serious games–based study to increase HIV protective behaviors in Swaziland and SSA; therefore, our findings will be a timely contribution to literature.

References:

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