GAMES FOR HEALTH JOURNAL: Research, Development, and Clinical Applications
Volume 1, Number 4, 2012

DOI: 10.1089/g4h.2012.0025

A Qualitative Study to Inform the Development of a Videogame for Adolescent Human Immunodeficiency Virus Prevention

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Abstract

We used qualitative methods to inform the development of an interactive videogame focused on behavior change to reduce risk and promote human immunodeficiency virus (HIV) prevention in young minority adolescents. Guided by community-partnered research principles, we conducted and analyzed 16 individual interviews and six focus groups with 10–15 year-old boys and girls (36 unique participants) at a neighborhood-based nonprofit organization serving youth from low-resource neighborhoods. Three recurrent themes lent themselves to translation into a videogame-based intervention. Adolescents reported protective factors and facilitators to engaging in risk behaviors, including (1) their personal ability to balance the tension between individuation and group membership, (2) the presence of stable mentor figures in their life, and (3) the neighborhood in which they live. We used these themes to inform the design of our videogame intervention with the goal that these methods may increase the intervention's efficacy at promoting HIV prevention by making them more tailored and relevant to a specific population. Our qualitative study provides a practical understanding of how important elements identified by minority youth regarding negotiating around risk behaviors can be integrated into a videogame intervention. These findings offer valuable insights to researchers whose goal is to design effective and tailored interventions to affect behavior change.

Introduction

The high-risk behaviors of young adolescents increase their chances of sexually transmitted infections (STIs), including human immunodeficiency virus (HIV).[1] In 2009, 33 percent of 9th graders reported having had sexual intercourse, with one-third of them reporting not using a condom during their last sexual encounter.[2] Young adults and adolescents have the highest rates of acquiring HIV. In 2009 39% of new HIV infections occurred among individuals 13–29 years old, a 21 percent increase in incidence since 2006.[3] More specifically, minority youth are disproportionately affected by HIV infection. In 2009, 17 percent of adolescents were identified as African-American, but an estimated 73 percent of diagnoses of HIV infection in 13–19 year olds were in African-American adolescents.[4] Less dramatic but still significant is the statistic that 16 percent of total incident cases of HIV were among Hispanic/Latino, even though they only represented 13 percent of the population.[4] Given that only 3–15 percent of all adolescents state that they have engaged in sexual activity prior to 13 years of age, the age group of 10–15 year olds may be an optimal window of opportunity to target for primary HIV prevention.[2]

In order to address HIV risk behaviors in this population, several sexual risk reduction programs for adolescents have been studied and found to be effective.[5–7] A systematic review of STI/HIV programs suggested that interventions that were most successful at decreasing sexual risk behaviors in adolescents were those that were specifically tailored and delivered the intervention to a particular subgroup.[5] Additionally, the review described other effective strategies for STI/HIV prevention interventions for adolescents, including (1) targeting behaviors that are most amenable to change, (2) using behavioral theory to guide program development, and (3) addressing

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This research was presented, in part, at the Yale Center for Interdisciplinary Research on AIDS (CIRA) AIDS Science Day on March 23, 2011, New Haven, Connecticut.

overall risk and not just sexual risk in interventions. Building on proven components of these interventions, we sought to develop an interactive videogame for HIV prevention in adolescents who are at high risk for HIV and other STIs.

To inform the development of a videogame for HIV prevention targeting minority young adolescents, we conducted a qualitative study, guided by community-partnered research principles, to determine factors among young minority adolescents that impact their decisions whether to participate in HIV risk behaviors. Whereas previous technology-based HIV interventions have used theory to guide their development, community-partnered research techniques to enhance the tailoring of the intervention have not been commonly used.[8] Community-partnered research is a useful technique for videogame-based intervention development because it engages the users throughout the game development process and therefore may increase the game's appeal, salience, and realism. Therefore, the purpose of this study was to use community-partnered research principles to determine factors in young minority adolescents' environments that impact their decisions whether to participate in HIV risk behaviors and then use these findings to directly inform the development of the virtual environment in an HIV prevention videogame. We present this work as a case study to demonstrate how these methods represent an important strategy for informing an HIV prevention videogame intervention.

Subjects and Methods

Participants

In partnership with a well-established neighborhood afterschool program in the area, we conducted a qualitative study using in-person in-depth interviews and focus groups to explore the perspectives and experiences of young minority adolescents to understand the factors impacting whether they participate in HIV risk behaviors. We used a purposeful sampling approach targeting "information-rich" individuals with first-hand experience of our research interest,[9,10] which included identifying the protective elements and risk factors associated with engaging in HIV risk behaviors. We recruited adolescents 10–15 years old who attended a subsidized nonprofit youth afterschool/summer enrichment program in New Haven, CT. Inclusion criteria were that participants were English-speaking and between 10 and 15 years old for the interviews and 11 and 14 years old for the focus groups. We chose to use a broader age range for the individual interviews in order to capture the perspectives of both younger and older children in our target population. We then narrowed the age range for the focus groups. The Human Investigation Committee at Yale University School of Medicine approved the research protocol. All participants provided written informed assent, and participants' parents or legal guardians provided written informed consent. Participants and their parents or guardians were reimbursed with gift cards.

Interviews and focus groups

We used two different data gathering methods—individual interviews and focus groups—to enhance the breadth and depth of our data. We used in-depth interviews to generate data that explore individual experiences and perceptions,[11] while we conducted focus groups to discover more about topics that involved social norms.[12]

In collaboration with the afterschool program's leadership, we designed the recruitment strategy for study participants, including placing posters and distributing fliers at youth programs. We developed our interview guide in an iterative process with input from key personnel at the afterschool program. One research team member (K.H.) conducted the in-depth interviews and the subsequent focus groups with the support of key program personnel using semistructured qualitative guides. We conducted 16 in-depth face-to-face individual interviews, and these results were used to develop our focus group guide. Discussion guides evolved as data collection and preliminary analysis progressed.[13] Domains explored included videogame play, risk taking, decision-making, peer influence, and future orientation. Probes were used to encourage clarification and evoke greater detail into participants' narrative. Interviews and focus groups were audiotaped, professionally transcribed, and reviewed by a research team member (K.H.) to ensure accuracy. Focus groups included three female-only and three male-only single gender groups, each including four or five participants.

Data analysis

A three-person multidisciplinary team, composed of individuals with expertise in pediatrics, HIV, qualitative methods, community-partnered research, and health behavior, conducted data analysis of the in-depth interviews. For the analysis, we used the principles of grounded theory, including the constant comparative method.[13] We developed the codes in a stepwise fashion,[10] beginning with the creation of an initial code structure from the first two transcripts that were independently reviewed by each team member. We continued to code the transcripts in sets of two until a comprehensive code structure was created that captured all data concepts. To reach consensus, the team met regularly to negotiate code structure and discuss emergent themes. Once a final code structure was established, one of the team members (K.H.) systematically applied the codes to the remaining seven transcripts. Data were entered into ATLAS.ti (version 5.0; Scientific Software Development, Berlin, Germany) to facilitate data organization and retrieval.

Data analysis for the focus groups followed a similar analytic approach; however, we expanded the team to include two additional team members with expertise in HIV and adolescent medicine. All focus group transcripts were independently reviewed one at a time, with the team meeting to refine codes, negotiate consensus, and compare content with previously coded data to ensure consistent classification. The team then identified themes using the codes from the individual interview and focus group data. We then considered how these themes would directly inform the videogame development. We conducted recruitment and data collection for both the interviews and focus groups until we reached thematic saturation.[9,14]

Results

Demographic data

In total, 36 adolescents (16 boys and 20 girls) 10–15 years old (mean age, 11.6 years) participated in either the

individual interviews ($n = 11$), the focus groups ($n = 20$), or both ($n = 5$). Seventeen (47 percent) were Hispanic/Latino, 14 (39 percent) African-American, 3 (8 percent) multiracial, and 2 (6 percent) white.

Themes

We identified three themes that describe the adolescents' perspectives on factors in their lives that influence whether they engage in HIV risk behaviors. Adolescents of both genders perceived their ability to avoid HIV risk behaviors, increasing their chance for future success to be based on (1) their personal ability to balance the tension between individuation and group membership, (2) the presence of stable mentor figures in their life, and (3) the ability to be independent of the neighborhood in which they live. We then considered how each theme could be translated into our videogame intervention.

Personal ability to balance the tension between individuation and group membership. Adolescents described how self-preservation was impacted by group participation. To avoid risky behaviors, one adolescent reported compromising friendships:

> Like if your friends were doing something like bad, and they wanted you to come with them, and you were like, "No I got to do something," and you got to make sacrifices. Like they don't want to be your friend anymore.

One adolescent provided an example of how the tension between self and group was life-threatening:

> I'm in the gang, say…they have a choice, shoot this person or you die…The risk of shooting the person is; you'll just have that memory all in your head every day. The risk of not shooting the person you will get killed. You'll just have that memory in your head. Like you'll go to sleep and be like you'll be like oh man, I can't sleep, just thinking I shot that innocent guy. You know, he did nothing. I just shot him so he wouldn't tell on my gang or something like that. Ugh. And now look at me; I'm a bum. Ugh.

In partnership with our videogame developers, we will incorporate this theme of self versus group by creating situations in which the player has to choose between following his or her own choices or belonging to a group. For instance, one scenario will include having the player decide whether or not to attend an unsupervised party where alcohol will be served. As the game progresses, the player will experience how his or her choices about whether or not to participate in the group might influence different life outcomes. The game will also include a skill-building component that provides the player with the opportunity to practice self-preservation skills by refusing their peers.

Presence of stable mentor figures in their lives. Adolescents highlighted the importance of having supportive, stable mentor figures in their lives to provide them with guidance and encouragement as well as teach them essential life skills to navigate their environments. These individuals included parents, older siblings, cousins, aunts, uncles, and teachers and provided the youth with a sense of security and confidence. One adolescent described his fifth grade teacher as his supportive mentor figure:

> She was, like, hard and tough on me. Say, if I tell her something I was worrying about and stuff like that, she will always tell me that, "Are you smart enough?" or if I wanted to do something bad, she will send me to the principal's office to learn my lesson…She's nice to me sometimes. She's mean to me just to, like, I guess, to set me straight…She always believed in me when I didn't believe in myself.

Another adolescent described his uncle's role as a stable mentor figure:

> Someone that I look up to is my 17-year-old uncle because like he tells me the right things to do and the wrong things to do. He like role models for me…He like shows me a lot…he shows me a lot of love and like shows me that he cares about me and stuff like that.

For these adolescents, evidence of security also translated into both forgiveness and disciplinary action. One adolescent specifically described how a supportive mentor set limits and enforced rules and boundaries:

> They tell me what's not right and what's right. Sometimes, they may help me control myself if I'm in a bad situation, what to do, how to solve that problem and stay away from stuff, bad things, keep me out of the streets, and stuff like that.

We will incorporate this theme of stable mentor figures throughout our videogame by providing supportive, older characters who demonstrate their investment in the player through encouragement, setting boundaries, giving feedback and guidance around risk-taking, and articulating expectations for success.

The neighborhood in which they live. Adolescents expressed the feeling that their neighborhood or community possessed inherent risks that had the potential to limit their success. To succeed, they described overcoming barriers in their current environment. They reflected that when people were able to extricate themselves from a high-risk environment, such as leaving a bad neighborhood, their chances to succeed substantially increased. For example, one adolescent described his neighborhood in terms of it being his destiny; the environment defined his chance for success or failure:

> Like, if you live in a place where there's a lot of shootings, knifings, cuttings…in a place with a lot of thieves and things that can change your life…then you can live in a good place and you can't afford it and then you can move to a bad place and then your life gets messed up again.

This adolescent acknowledged the difficulty of trying to separate himself from his surroundings:

> Sometimes like, the environment that you live in can make it hard to be successful because you see everybody doing one thing, and you try to be just like them.

We will incorporate this theme of their neighborhood's influence throughout our videogame by creating opportunities for the player to establish personalized future goals and aspirations, such as educational attainment, career choice, and important relationships that would potentially allow him or her to move beyond or out of the neighborhood. To achieve these aspirations, the player will need to learn how to navigate risks in his or her neighborhood, orient him- or herself to the future, and make decisions that will ultimately influence the likelihood of achieving future goals and aspirations.

Discussion

In this study, adolescents described factors within themselves and people in their lives and their neighborhood that impacted their ability to negotiate high-risk situations. These factors included balancing the tension between individuation and group membership, having stable mentor figures in their lives to teach them essential life skills, and being able to navigate the hazards within their neighborhood. Our findings build upon research that highlights the importance of resilience, role modeling, and mentoring as constructs of particular value in efforts to influence health-risk and health-protective behaviors among adolescents.[15] In addition, these findings, specific to our particular target population of young minority adolescents, are potentially "portable" to a videogame intervention focusing on behavior change around risk reduction.

These findings are consistent with the ecological theory of Bronfenbrenner[16,17] which describes the progressive, mutual accommodation between an active, growing human being and the changing elements within his or her immediate settings, including peers, family, and neighborhood. Bronfenbrenner emphasized protective processes at different levels that can foster resilience in adolescence. Although adolescents may not have control over various aspects of their larger environment, such as the neighborhood they live in or the school they attend, they may be able to counteract the negative effects of these systems by controlling other, closer aspects of their environment, such as interactions with peers and mentor figures. One of the primary goals of the current videogame intervention is to provide adolescents with risk reduction skills and the venue in which to safely practice these skills in order to better navigate risk in the different levels of their environments.

The qualitative research phase of this study identified themes consistent with previous work.[18–22] For example, in a study exploring Latino adolescents' perception of barriers to and facilitators of success, these adolescents identified peers more as potential barriers to success than sources of support and identified mentors outside the family as facilitators of success.[18] Our findings are also consistent with findings in the literature examining resilience in youth that argue that any intervention to reduce high-risk behaviors needs to address the three levels of influence described by youth: Self versus group, presence of stable mentors, and the neighborhood in which youth live.[23,24] It is notable that our study expands on the existing literature by using qualitative methods to directly inform the development of our videogame, including community-partnered research, which is recognized as important for developing HIV prevention interventions.[8,25] We believe that our study is one of the first to use these well-validated methods to inform the development of a novel intervention.

As we incorporate these data into the proposed videogame we are developing, our goal is to first help adolescents recognize the realms in which they do have control over their lives. Our second goal is to help them to develop the skills to modify how they interact with the three levels of influence. In the proposed interactive videogame, adolescents will have opportunities to adopt and practice skills, such as learning how to refuse peer pressure, differentiate positive and negative mentor figures, and negotiate high-risk environments within the game play with the goal that these skills will transfer to real life.

Our study has several limitations. First, our sample was drawn from a single community-based program serving urban, mostly minority adolescents living in high-risk neighborhoods. The experiences and perceptions of older adolescents or those from other racial and ethnic groups and other neighborhoods may be different. Second, participants may not have been as forthcoming in their discussion about their engagement in certain high-risk behaviors. We believe we were able to counteract this, in part, by including trusted staff members of the program as co-facilitators.

Our findings reveal a rich sense of adolescents' perceptions of the three spheres of influence in their ongoing negotiation to avoid risk behaviors. Additionally, these qualitative data provide a practical understanding of the important elements identified by our target audience as being crucial components to be integrated into our videogame intervention. The information collected through our interviews and focus groups provides important content for the development of the proposed videogame that is currently under development and will be evaluated through a large-scale randomized clinical trial. In addition, the process outlined in this article highlights the feasibility and potential utility of using qualitative research methods to inform the creation of a targeted and relevant technology-based intervention for the purposes of skill-building and behavior change. We believe our results offer valuable insights to researchers whose goal is to design effective and tailored interventions to affect behavior change in order to help adolescents better negotiate risk in their environment.

Acknowledgments

This study was supported by grant RO1 HD062080-01 from the National Institute of Child Health and Human Development and by the Yale Robert Wood Johnson Foundation Clinical Scholars Program. Lynn E. Fiellin, MD, Principal Investigator, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. We are grateful to Gail Slap, M.D., M.S., for her critical review of earlier versions of this manuscript.

Author Disclosure Statement

No competing financial interests exist.

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