Methods to assess youth engagement in a text messaging supplement to an effective teen pregnancy program

CrossMark

Sharon Devine [a], Caroline Leeds [b], Judith C. Shlay [b,c], Amber Leytem [b], Robert Beum [b], Sheana Bull [a,*]

[a] University of Colorado, Colorado School of Public Health, Department of Community and Behavioral Health, Denver, CO, United States
[b] Denver Health and Hospital Authority, Denver Public Health, Denver, CO, United States
[c] University of Colorado, School of Medicine, Department of Family Medicine, Aurora, CO, United States

ARTICLE INFO

ABSTRACT

Youth are prolific users of cell phone minutes and text messaging. Numerous programs using short message service text messaging (SMS) have been employed to help improve health behaviors and health outcomes. However, we lack information on whether and what type of interaction or engagement with SMS program content is required to realize any benefit.

We explored youth engagement with an automated SMS program designed to supplement a 25-session youth development program with demonstrated efficacy for reductions in teen pregnancy. Using two years of program data, we report on youth participation in design of message content and response frequency to messages among youth enrolled in the intervention arm of a randomized controlled trial (RCT) as one indicator of engagement.

There were 221 youth between the ages of 14–18 enrolled over two years in the intervention arm of the RCT. Just over half (51%) were female; 56% were Hispanic; and 27% African American. Youth were sent 40,006 messages of which 16,501 were considered bi-directional where youth were asked to text a response. Four-fifths (82%) responded at least once to a text. We found variations in response frequency by gender, age, and ethnicity. The most popular types of messages youth responded to include questions and quizzes. The first two months of the program in each year had the highest response frequency.

An important next step is to assess whether higher response to SMS results in greater efficacy. This future work can facilitate greater attention to message design and content to ensure messages are engaging for the intended audience.

© 2015 Elsevier Inc. All rights reserved.

1. Introduction

Youth utilize cell phones in substantial numbers to communicate, using text messaging with frequency. Recent data suggest that youth use cell phone minutes and text messaging more than other groups [1–3].

There is a growing body of literature that demonstrates that technology-based health promotion programs operating as stand-alone educational interventions can work to increase physical activity, improve nutrition, reduce smoking, and improve sexual behavior. Meta-analyses of Internet and cell phone text messaging programs demonstrate their efficacy for facilitating improvements in knowledge and behavior change [4–8]. Most recently, a meta-analysis of health related text-messaging programs shows that programs with a strong theoretical framework, tailoring and personalization and variations in message frequency over time had greater effects than programs without these features [4].

Research has demonstrated the promise of using social media and cell phones for interventions to reduce sexual risk behavior [9–13]. The 411 program, for example, was developed specifically for young Black men aged 16–20 and illustrates the utility of specifically targeting minority youth using text messaging; data from the 411 program showed that youth, in particular youth of color, will indeed enroll and engage in a cell phone intervention and stay in the program over time [14].

Stand-alone technology-based initiatives have potential for substantially greater reach than face-to-face interventions, and evidence shows their short-term small to medium effects are equivalent to non-technology-based programs [6]. However, we have identified at least two concerns with technology-based health promotion and disease prevention programs that exist only in

* Corresponding author at: Community and Behavioral Health, Colorado School of Public Health, 13001 E. 17th Place B119, Aurora, CO 80045, United States. Tel.: +1 303 724 1238.

E-mail address: sheana.bull@ucdenver.edu (S. Bull).

cyberspace, without connection to a "real world" educational or clinical program. First, the ever-increasing number of websites, Internet-based programs, games and apps makes it difficult for a health promotion and disease prevention program to stand out in a compelling way to compete for and sustain attention. This surfeit of venues limits the opportunities to realize the promise for using technology to reach large numbers of the population. Second, health educators and clinicians in well-established and credible service organizations miss valuable opportunities to connect with and support their clients when they do not have an Internet and/or social media presence, particularly with technology "natives," i.e., persons born after the advent of the Internet age who expect to access and communicate with care providers and educators via social and mobile media.

We were interested in exploring the viability of promoting "hybrid" health education and disease prevention programs, linking effective face-to-face and technology-based efforts. We anticipate that doing so could substantially extend the reach of health promotion and disease prevention programs, intensify their effects, and increase their sustainability over time. These strategies combined with systematic efforts to design theory-based, tailored text message programs could result in public health programs with greater population effect.

A fundamental barrier to our understanding of how to improve the impact of technology-based programs—stand-alone or hybrid—is the type and degree of participation and interaction with content required to realize effects. While the literature on text messaging programs identified here does demonstrate their efficacy, we know little about the types of messages that resonate and are popular with audiences. This is a critical first step preceding inquiry into how much exposure is needed to generate and sustain effects and whether and how much participation and interaction—we label this "engagement"—with content via bi-directional messaging, commenting, or responding to messages is necessary to experience benefits from exposure to programs.

The objective of this paper is to identify characteristics of SMS that elicit a response from adolescents as part of a large randomized trial of SMS messaging used to supplement a group-level, evidence-based teen pregnancy prevention program (Wyman's Teen Outreach Program®, or TOP®). We first describe a qualitative study in which findings from focus groups and individual interviews contributed to the development of the SMS message library used in the trial. We then describe preliminary quantitative findings from the trial documenting youth interaction with messages.

2. Materials and methods

We collected formative data to facilitate program design and implementation data to monitor process for a cluster-randomized trial, partnering the Boys & Girls Clubs of Metro Denver with the Denver Public Health Department and the Colorado School of Public Health. The TOP® curriculum is delivered once per week in a one-hour session over 25 weeks in eight Boys & Girls Clubs each year and four of these clubs are randomly selected each year to offer the text message supplement, delivered by Denver Public Health via an automated text message platform. Investigators at the Colorado School of Public Health are evaluating the program and the Colorado Multiple Institutional Review Board has reviewed and approved all study methods, including the qualitative focus group discussions and in-depth interviews as well as the randomized trial. Participants offered their written informed assent for all qualitative activities described here following a description of the study by the focus group moderator and interviewer. For the trial, participants reviewed a video in a computer lab in their respective Boys & Girls Club describing the study as

an assessment of a text message program to enhance an effective teen pregnancy prevention program (TOP®). The video described study procedures. Following the video, youth were asked to document their assent via a self-administered survey online prior to completing study assessments. We received a waiver of parental consent for youth participation. The trial was designed to run for four years, generating a total of 16 clubs receiving standard TOP® and 16 receiving standard TOP® and the text message supplement. All participants were incentivized to participate in TOP® with a pro-rated stipend of $2.50 per session attended. They were further incentivized to complete study assessments with a $10 incentive for completion of the baseline assessment and $15 each for completion of assessments at 9 months and 21 months after enrollment. No additional incentives were offered for participation in the text message supplement.

2.1. Formative data collection and analysis

Formative data were collected through six focus group discussions with 59 youth in Boys & Girls Clubs and from 12 one-on-one semi-structured in-depth interviews with youth participating in a one-month pilot of the text message and TOP® program prior to implementation. Topics covered in the focus groups and in-depth interviews included motivations for and context of text messaging; text messaging habits (e.g., whom participants text, for what purpose, and how often); solicitation of ideas to make text messages memorable and engaging; and solicitation of responses to initial text message drafts. We completed a content analysis on data from these qualitative focus group discussions and interviews. Coding and analysis of data were facilitated by use of Atlas Ti, enabling the investigators to code, index, and retrieve participant responses containing key themes, concepts, or events, and group these into larger categories. Prior to data collection, an initial codebook was created containing codes and categories (groups of codes) of themes, concepts, events, people, actions, and things we anticipated would be encountered in the data (e.g., youth preference for humorous text messages, cultural references like song lyrics). These *a priori* codes were also based on youth preferences the investigators expected to identify based on the literature. Coding strategies were based on the grounded theory techniques of open, axial, and summary coding, as described by Strauss and Corbin [15]. Open coding was used to name and categorize key concepts, categories, and patterns of experience, by breaking down, examining, comparing, and grouping phenomena. Axial coding was used to specify the relationship of categories to the phenomenon under study—in this case preferences for time of day for messages, and gender-defined preferences for message content. Finally, summary coding synthesized findings into key actionable strategies for message development.

These analyses allowed us to develop a text message library as well as a schedule for sending messages throughout the duration of the program. Given the strong empirical evidence supporting the use of behavior change theory in health promotion, our messages supported positive attitudes, norms, and intentions at the individual level to facilitate behavior change [16,17]; helped to build skills and confidence to perform skills (self-efficacy) [18]; and offered unambiguous role modeling and tailoring to individuals to support healthy behaviors [19]. In addition, our message design drew from a strong body of health communication literature that suggests that messages that are positively framed can be more effective [20] and that we can use real time cues to help people act in the most relevant moment to implement change. Conclusions from the literature suggest that messages do not necessarily need to convey content that readers will highly value [21]. Instead, messages can contain content that is of peripheral value to the reader, and still be useful if they offer an immediate opportunity to act