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WHAT PARENTS WANT: DESIGNING AN INTERACTIVE WEB-BASED PROGRAM TO IMPROVE PARENT-ADOLESCENT COMMUNICATION ABOUT SEX

by

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Abigail Johnson, MPH

University of Pittsburgh, 2012

Background: Parent-child communication is associated with decreased adolescent sexual risk-taking. To date, interventions targeting parent-child communication have been delivered via face-to-face formats. However, online interventions offer several advantages: cost, reach, program fidelity, anonymity and opportunity for individualized feedback. **Objective:** The present study sought to identify parents' preferences regarding interactive features for a web-based program to improve parent-child communication about sex. **Methods:** We conducted seven focus groups with parents (n=29) in Allegheny County, PA to identify their preferences for interactive features to be included in the web program. **Results**: Parents identified four main interactive features: Ask the Expert, Chat Rooms, Supplementary Information Delivery Modes and Links to Face-to-Face Programming. Parents were interested in receiving individualized feedback regarding their questions/concerns, as well as online peer support. They were also interested in receiving information through other communication tools (texts, email, mail) and having the program connect them to face-to-face programs or seminars. Lastly, parents expressed their desire that the web intervention include a component for children. **Conclusions:** Understanding what interactive features parents want can help optimize program completion and satisfaction. **Public Health Significance:** Web-based programs have the potential to reach a large number of parents equipping them with new knowledge and skills to influence their adolescent's sexual health behaviors.

TABLE OF CONTENTS

PREFACE ..... **IX**

1.0 INTRODUCTION **1**

2.0 BACKGROUND **3**

2.1 ADOLESCENT SEXUAL HEALTH OUTCOMES **3**

2.2 AN ECOLOGICAL FRAMEWORK FOR ADOLESCENT SEXUALITY **5**

2.3 INFLUENCE OF PARENTAL COMMUNICATION ABOUT SEX ON ADOLESCENT SEXUAL HEALTH BEAHVIORS **7**

2.4 INTERVENTIONS TARGETING PARENT-ADOLESCENT COMMUNICATION ABOUT SEX **10**

2.5 WEB-BASED INTERVENTIONS **11**

2.6 CURRENT STUDY **14**

3.0 METHODS **16**

3.1 SETTING **16**

3.2 ELIGIBILITY AND RECRUITMENT **17**

3.3 DATA COLLECTION **18**

3.3.1 Focus Group Methods **19**

3.3.2 Protecting Confidentiality. **20**

3.4 DATA ANALYSIS **21**

4.0 RESULTS 22

4.1 PARTICIPANT DEMOGRAPHICS 22

4.2 OVERVIEW OF DESIRED INTERACTIVE FEATURES 23

4.2.1 Ask the Expert 23

4.2.2 Chat Rooms. 24

4.2.3 Supplementary Information Delivery Modes 24

4.2.4 Links to Face to Face Programming. 25

4.2.5 Opportunity for Co-Learning with Adolescent 26

5.0 DISCUSSION 28

5.1.1 Implications for Health Communication Theory 30

5.1.2 Study Limitations 31

6.0 CONCLUSION 33

BIBLIOGRAPHY 34

LIST OF TABLES

Table 1. Participant Demographics 22

LIST OF FIGURES

Figure 1. Bronfenbrenner's Ecological Systems Theory..... 6

Figure 2. Affect of Parental Communication on Adolescent Behavior..... 8

PREFACE

I would like to thank my thesis committee for their unwavering support and encouragement throughout this process. First, I would like to thank Dr. Akers for her tireless mentorship and guidance during my graduate education and for allowing me to work with her research team. I appreciate the countless hours she spent reviewing drafts of my paper and for meeting with me weekly to advise on my academic, professional and personal goals. I would like to thank Dr. Friedman for his patience and devotion to my success as a BCHS student and for reminding me that nothing is impossible. I would also like to thank Dr. Burke and Dr. Charron-Prochownik for their constructive feedback and helping me think critically about the future implications of this work. Lastly, I would like to thank my family and friends for walking with me every step of the way through this journey.

1.0 INTRODUCTION

Adolescents who engage in risky sexual practices are at a greater risk for negative health consequences including sexually transmitted infections (STIs) and unintended pregnancies. Teens report that their decisions about sex are most influenced by their parents (Albert, 2007). Adolescents who have talked to their parents about sex are more likely to delay sexual initiation and use condoms and contraceptives when they do become sexually active (DiIorio, 2003). Thus, improving parent-adolescent communication about sex is a promising strategy for decreasing adolescent sexual risk-taking.

Interventions developed to improve parent-adolescent communication have been shown to increase the frequency and improve the quality and timing of parent-adolescent communication (Blake et al., 2001; DiIorio et al., 2007; Forehand et al., 2007; Hadley et. al., 2008; Stanton et al., 2002). However, these interventions have largely been delivered via face-to-face formats. Online interventions offer several advantages compared to traditional face-to-face programs including lower cost, reach, scalability and adaptability (Bennett and Glasgow, 2009). In addition, web-based interventions have been deemed efficacious across a wide range of health conditions (Wantland et al., 2004).

The effectiveness of web-based programs can be enhanced by developing programs that are interactive, media rich and incorporate personal assessment tools and opportunities for individual learning (Billings, Cook, Hendrickson & Dove, 2008). Few studies have explored

which interactive web tools parents are interested in using in a web intervention to improve parent-adolescent communication. The present study describes one component of formative research used to inform the development of an interactive web-based program to improve parent-child communication about sex.

This paper will briefly review theory and literature on the determinants of adolescent risk sexual behavior with a strong emphasis on parenting factors, namely parental communication. Next, the paper will summarize findings from focus groups with parents to identify their preferences regarding interactive features of the website. Lastly, the paper will make recommendations for developing effective online interventions to improve parental communication about sex.

2.0 BACKGROUND

2.1 ADOLESCENT SEXUAL HEALTH OUTCOMES

According to the 2009 Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Surveillance Survey (YRBSS) nearly half of all youth attending high school reported having engaged in heterosexual intercourse (CDC, 2010). Of this population, 40% did not use condoms during their last sexual experience. Furthermore, 11% of high school girls and 16% of high school boys report having four or more lifetime partners (CDC, 2010). These behaviors place sexually active teens at risk for adverse health outcomes including sexually transmitted infections (STIs) and unintended pregnancies (CDC, 2010).

Although adolescents ages 15 to 24 represent 14% of the U.S. population, they account for nearly half of the 19 million new STI infections diagnosed each year (Weinstock et al., 2004). In a nationally representative sample of teenage girls, researchers found that 1 in 4 females aged 14-19 tested positive for an STI, with the most common infection being human papilloma virus (HPV) (Forhan et al., 2009). STI infections in young women are of great concern because of the health consequences that can result from an infection left untreated. STIs have been shown to cause pelvic inflammatory disease (PID) which can lead to infertility, ectopic pregnancy, and other reproductive health complications. In addition, sexually transmitted infections may also facilitate the transmission of HIV. Individuals infected with an STI at least

once, are five times more likely to contract HIV (Chiaradonna, 2008). In 2006, youth aged 13-24 represented 14% of newly diagnosed HIV/AIDS cases (CDC, 2008). STIs also impose a significant economic burden. In 2000, the estimated cost of STIs in the U.S. among 15-24 year olds was $6.5 billion (Chesson et al., 2004).

Although the U.S. teen birth rate has declined in recent years, the rate is still higher than any other industrialized nation. Every year, nearly 750,000 American adolescents aged 15-19 become pregnant and 400,000 give birth. Thus, 3 out of every 10 girls (Hamilton, Martin & Ventura, 2010) experience a pregnancy before age 20, of which 80% are unintended. This is the highest rate of unintended pregnancy among all women of reproductive age. In addition to the health and wellbeing of the teen mother and her child, teen pregnancy has many economic consequences. The most recent data estimates that the federal government spends over $9.1 billion dollars a year to provide support services for families that begin with a teen birth (Hoffman, 2006). These costs include $2.3 billion increased child welfare costs, $1.9 billion increased public sector health care costs, $2.1 billion additional costs for state prison systems and $2.9 billion in lost revenue as a result of lower taxes paid by teen mothers during adulthood (Hoffman, 2006).

Teenage pregnancies also result in many negative consequences for teen mothers and their children. Teen mothers are less likely to complete high school. Young moms may experience poorer health outcomes, poverty, welfare dependency, single motherhood and repeat pregnancy (Hoffman, 2006). Children born to teen mothers are more likely to be premature and experience infant mortality (Santelli & Melnikas, 2008).

Given the social, economic and public health consequences associated with high-risk sexual behavior among adolescents, there is a dire need to develop effective health programs to

promote healthy youth development and prevent teen sexual risk-taking. However, researchers must first understand the risk and protective factors associated with sexual risk-taking. The next section will present a model used to understand variables that influence adolescents' sexual health.

2.2 AN ECOLOGICAL FRAMEWORK FOR ADOLESCENT SEXUALITY

There are numerous individual and environmental level factors that influence adolescent sexual risk-taking. Effective interventions must take into account the multiple levels of influence on adolescent sexuality. Bronfenbrenner's Ecological Systems Theory (1979) is one model that uses a multisystem approach to understand childhood development and has been cited as an organizing framework for identifying antecedents of adolescent sexual behavior (Luster & Small, 1994). The model posits that adolescents live in a set of interconnected systems that shape their behaviors (Figure 1). The most proximal level, the *microsystem*, includes individual level factors such as the roles and characteristics of the individual. Individual factors include biological factors (e.g., pubertal timing, gender), cognitive factors (e.g., developmental stage, abstract thinking capacity), mental health (e.g., self-esteem, depression, anxiety) and engagement in other risk-behaviors.

The *mesosystem* reflects social contextual settings in which the child interacts. For example, peer attitudes and behaviors regarding sex have been shown to influence adolescent sexual risk-taking. Adolescents who believe their friends have favorable attitudes towards using condoms during sex will be more inclined to use condoms (Stanton et al., 2004). Romantic partners also influence whether teens practice safe sex. Adolescents who have older boyfriends

and girlfriends are more likely to engage in sexual activity (Marin et al., 2000). The family is also an important mediating factor for adolescent sexual health. Family factors will be addressed in the next section.

The *exosystem* includes the social factors that indirectly affect the child's development such as the parental workplace. Finally, the *macrosystem* represents the larger social and physical environment including cultural and economic influences such as neighborhood poverty, socio-economic status, and racism. Adolescents who live in neighborhoods that are characterized by high residential turnover, poverty and crime rates, tend to have early onset of sexual intercourse, low use of contraception and high pregnancy rates (Miller, Benson and Galbraith, 2001). Voisin (2005) found that adolescents exposed to childhood sexual abuse and neighborhood violence were three times more likely to report high-risk sexual behaviors than peers not exposed. Similarly, Brewster et al. (1994) found that neighborhood socioeconomic status and unemployment were associated with an earlier age of sexual initiation among adolescents.

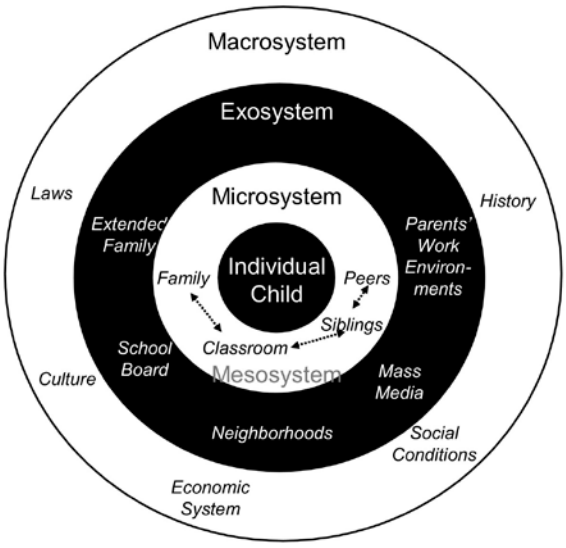

Figure 1. Bronfenbrenner's Ecological Systems Theory (Eisenmann et al., 2008)

Bronfenbrenner's model provides a broad overview of the multitude of risk and protective factors that influence adolescent sexuality. However, this paper will focus on one level of influence: the family.

2.3 INFLUENCE OF PARENTAL COMMUNICATION ABOUT SEX ON ADOLESCENT SEXUAL HEALTH BEHAVIORS

Familial factors are perhaps the most important influences on adolescent health behavior (Luster & Small, 1994). Parents are adolescent's first and primary sexual health educators. Many teens cite their parents as their preferred source of sexual health information (Albert, 2007). Among parenting processes, parental communication has been the most thoroughly studied for its effect on adolescent sexual behaviors and reproductive outcomes. Although early studies produced mixed results (Fox and Inazu, 1980; Hovell et al., 1994; Rodgers, 1999), more recent scholarship using better study designs have consistently shown a positive relationship between parental communication and reduced adolescent sexual risk taking. (Blake et al., 2001; DiIorio et al., 2003; Hadley et al., 2008; Stanton et al., 2002). These studies have shown that parent communication about sex influences adolescents' knowledge, attitudes and values regarding sexual activity, encouraging youth to engage in more protective behaviors and thus, resulting in fewer negative health consequences. Figure 2 summarizes this relationship.

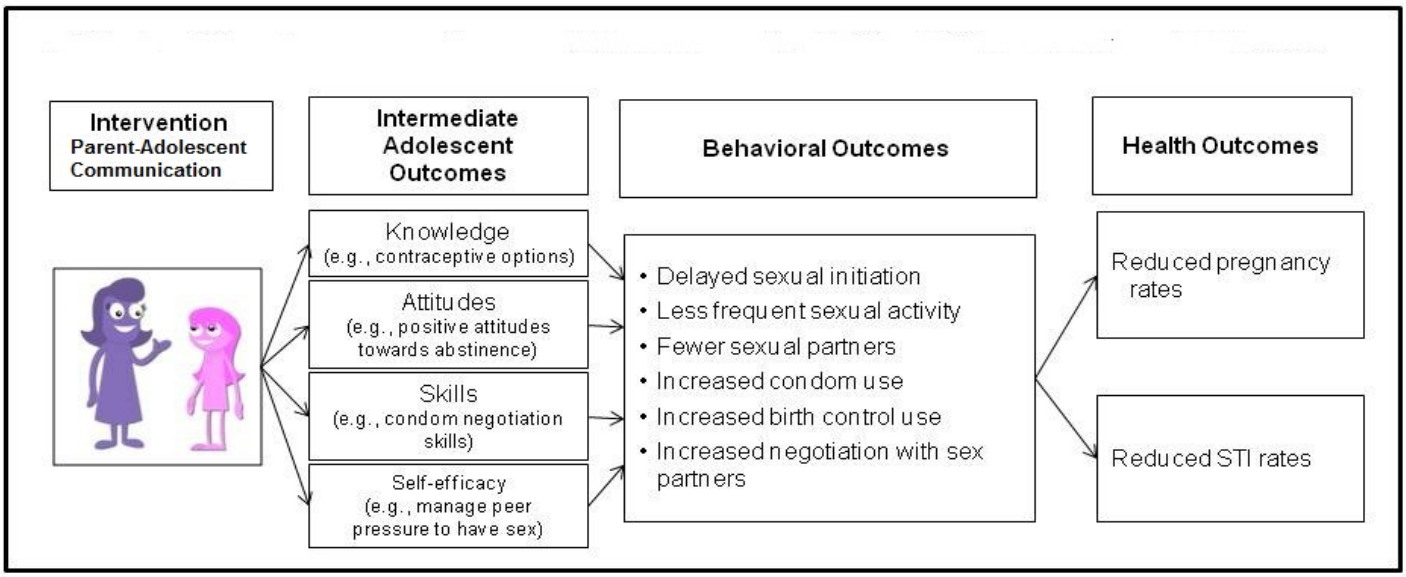

Figure 2. Framework Summarizing Effect of Parental Communication on Adolescent Behavior

The effects of parental communication about sex on adolescents are influenced by the content, quality and timing of the communication. Family discussions covering a broad range of topic areas, such as puberty, birth control, negotiating condom use and healthy relationships, result in fewer incidents of sexual risk taking among adolescents (Miller, Kotchick, & Forehand, 1999). Discussions that are more open and comfortable are more likely to be linked to safer adolescent sexual practices. Miller and colleagues (1999) reported fewer incidences of sexual risk taking among mothers and their adolescents when communication was described as open and receptive. Similarly, Miller et al. (1998) found that higher quality communication among mothers/adolescents was associated with less frequent sexual intercourse and fewer sex partners.

The timing of parental discussions is also important. Numerous research studies demonstrate the protective effects of family discussions of sex before adolescent sexual debut. For example, Miller et al. (1998) found that when discussions occurred prior to an adolescent's sexual debut, adolescents were more likely to use condoms. Another study found that discussions

that occur before sexual debut result in a later age at first intercourse and adolescent reports of having fewer sexual partners (Clawson and Reese-Weber, 2003).

Adolescent sexual health outcomes that result from parental communication may differ based on adolescent gender. Jaccard et al. (1996) found that parental sexual communication was related to increased contraceptive use for sons but not for daughters. Moore et al. (1986) reported that sexual communication among parents and adolescents was associated with a reduced probability of sexual initiation among daughters and an increased probability of intercourse among sons.

Parental values about sex also impact the effects of adolescent sexual behavior. Parental disproval of teen sex is predictive of later sexual initiation, less frequent sexual activity, and more consistent condom use (Jaccard et al., 1996; Miller et al., 1999; Resnick et al., 1997). In addition to parental values, parental role modeling influences adolescent risk-taking behavior. In one study, communication by mothers who held more conservative attitudes towards sexual activity was more effective at increasing safe sex behaviors among adolescents than communication with mothers who held more liberal attitudes towards sexual activity (Jaccard and Dittus, 1991).

It is evident that parent-child communication greatly influences adolescent sexuality. The next section will briefly review interventions targeting parent-adolescent communication and identify some of the gaps that exist regarding intervention delivery.

2.4 INTERVENTIONS TARGETING PARENT-ADOLESCENT COMMUNICATION ABOUT SEX

Interventions to improve parent-adolescent communication about sex are effective at improving parents' sexual health knowledge; increasing the frequency and breadth of sexual health topics covered, and reducing adolescent engagement in sexual risk behaviors. Akers et al. (2011) recently conducted a systematic review of twelve U.S. based interventions to improve parent-adolescent communication about sex. The researchers searched 6 electronic databases for studies published in peer-reviewed journals between January 1980 and July 2008. All interventions included in the study utilized experimental or quasi-experimental designs that included a control group and a pre/post-test design; and, targeted parents of adolescents aged 11 to 18 years. Studies were examined using eight communication domains (frequency, content, quality, comfort, self-efficacy, attitudes, outcome expectations and intentions). Methodological quality was assessed using the 11-item methodological quality score.

Overall, interventions improved multiple dimensions of parental communication including the frequency, content, quality, comfort, self-efficacy and intentions to communicate. Interventions were delivered in multiple settings including the home (n=1), via mass media (i.e., television and newspaper) (n=1) at worksites (n=1) and through schools, community organizations or churches (n=7).

Studies included in the review also demonstrated the influence of parent-adolescent communication on adolescent sexual health outcomes. For example, DiIorio and colleagues (2007) randomized 273 African American father-son dyads to the REAL Men sexual health communication intervention or a Nutrition Education program. At 4 month follow-up, adolescent boys in the intervention group were less likely to have initiated sex than those in the comparison

group. Sexually active participants in the intervention group also showed significant improvements in protective behaviors than those in the control group. At 12-month follow-up, intervention participants reported more consistent condom use. Similarly, Forehand et al. (2007) randomized 1,115 parent-dyad to an enhanced communication intervention (five 2.5 hour sessions), a single session intervention, or a single session general health intervention. At 12-month follow-up, preadolescents whose parents attended all 5 enhanced communication sessions had fewer incidents of sexual risk behavior than those in the single session and control group.

Despite the demonstrated effectiveness of parent-child communication interventions, few interventions have been disseminated widely. Traditional face-to-face interventions have several limitations. They require trained personnel, significant time commitments by parents and have limited reach as few parents can be accommodated per training cycle. The Internet presents a promising platform to address many of the challenges associated with face-to-face programs. The next section will briefly review the benefits of the Internet as a tool for delivering health programs. Web-based health interventions targeting parents will also be explored.

2.5 WEB-BASED INTERVENTIONS

Web based public health programs are increasing in popularity and have been deemed efficacious across a wide range of health conditions (Bennett and Glasgow, 2009). Among chronic disease prevention studies, programs targeting nutrition, diet/exercise, smoking and alcoholism have shown considerable success. For example, Southard et al. (2003) randomized 103 patients with cardiovascular disease (CVD) to either an Internet-based or traditional care intervention. The authors concluded that patients who received the web intervention experienced

fewer cardiovascular events and greater weight loss compared to controls. The return on investment was estimated at 213%. In another study, Swartz and colleagues (2006) randomized 351 individuals attempting to quit smoking to a video-based smoking cessation website or to a no-treatment control group. At 90-day follow up, the cessation rate among intervention participants was 24% compared to 8% among the control group.

In addition to their demonstrated effectiveness, internet programs offer several advantages over traditional programs including cost, reach, flexibility of program delivery and opportunities for individualized learning. Likewise, multimedia technology allows information to be presented in various modalities (e.g., text, voice, graphics, animation, and video) further enriching the learning process. These features facilitate active rather than passive learning and greater knowledge retention over time (Cook, 2007; Greenlee-Moore, 1994). Furthermore, parents frequently report the use of the internet as a reliable source of health information regarding their child's health (Cohall et al., 2004; Khoo et al., 2008; Tuffrey & Finlay, 2002).

Despite the potential benefits of web-based programs and parents' acceptability of the internet as a reliable source for health information, few evidence-based interventions exist that use a web delivery format to teach parents skills for communicating with their adolescent children about sex. In one recently reported randomized controlled trial, Villarruel and colleagues (2010) developed a computer-based parent-adolescent sexual health communication intervention for parents of Latino adolescents. The intervention was delivered over two sessions and used a variety of interactive features to provide parents with basic knowledge about adolescent sexuality and parent communication skills including videos, digitized case studies and an interactive question and answer radio show. At 3 month follow-up, parents assigned to the intervention reported greater sexual communication and comfort with communication than

parents in the control group. Additionally, adolescents whose parents received the intervention reported higher sexual communication than adolescents whose parents were assigned to the control group. Similarly, Cox et al. (2009) randomized rural mothers to a web-based sexual health communication intervention or a written program. The web-based intervention consisted of four components: (1) weekly interactive ‘‘how much do you know’’quizzes, (2) education about adolescent sexual health development and healthy relationships, (3) Web-based peer support, and (4) expert assistance and advice. At the conclusion of the study, the authors found that the web-based program was just as effective as the traditional written intervention. These results support the utility of web-based interventions to improve parent-adolescent communication about sex.

While few web based programs to improve parent-child sexual health communication have been developed, other computer-based health promotion interventions targeting parents of adolescents have shown great success. Deitz and colleagues (2009) developed an online intervention to provide parents with knowledge and skills regarding prevention and early detection of mental health problems in youth. Parents were either randomized to the experimental web program or the control wait group. Although not described in detail, the intervention consisted of four interactive modules. Following the intervention, the authors found that the online intervention was effective in improving parents’ knowledge of child mental health issues and increasing parents ’confidence in their ability to address mental health issues. Other programs have been successful in reaching parents of young adults. Donovan et al. (2012) reported that an online parent-based intervention aimed at reducing college-student alcohol use was effective in encouraging parents to discuss protective behavior strategies with their college age children. The web program was delivered using four methods, two of which were interactive

in nature: a video-based "click-through" section covering communication basics and a customizable question tool.

In summary, web-based programs offer several benefits to traditional face-to-face programs: cost, reach, program fidelity, anonymity. However, people learn differently in different environments. Thus, online interventions must be carefully conceptualized to be maximally effective. Online environments are a relatively new setting for intervention delivery; they possess unique features that can be capitalized on. Web-based intervention platforms can utilize new modes of presenting information and engaging visitors in the learning process that do not exist in face-to-face interventions. Few studies have explored which interactive web tools parents are interested in using in a web intervention to improve parent-adolescent communication. For example, would parents want to use such a website by themselves or in conjunction with their co-parent or even with their teen? Peer support groups have been a key component of successful online interventions for chronic disease management (Eysenbach et al., 2004). Would parents be interested in utilizing this feature as well? These questions have not been previously asked nor addressed in the two existing web-based parental-communication interventions.

2.6 CURRENT STUDY

This paper will present findings from focus groups held with parents to inform the development of a web-based program to improve parental-adolescent sexual health communication. Parents were asked to provide recommendations for the sexual health and communication skills content

of the website as well as the interactive features of the website. Because reproductive health and communication content remain consistent among parental communication programs and little is known about the process of translating these programs onto the web, this paper will focus exclusively on parents' recommendations for interactive features.

3.0 METHODS

Between October 2010 and February 2011, we conducted seven focus groups with parents of adolescents to identify which interactive features parents were interested in seeing on a web-site to help them communicate with their adolescent children about sex. Focus groups allow one to gather data from a number of participants at the same time while encouraging information exchange and a continual assessment of group norms, values and attitudes (Schatzman and Strauss 1973). They rely on interactions among participants who ask questions of each other, reflect on one another's comments, as well as consider and reconsider their understandings of specific situations and experiences. The interactive nature of the investigative process is a critical feature of this approach because it leads to greater insights regarding the origins of certain beliefs and opinions and highlights shared and variations in world-views, values and beliefs of participants. This study was approved by the University of Pittsburgh Institutional Review Board.

3.1 SETTING

We recruited in Pennsylvania which has the 12th highest rate of teen pregnancy among adolescents aged 15-19 years in the nation (Kost et al. 2010). More specifically, we focused on Allegheny County in western Pennsylvania which has the second highest number of birth to

teens aged 15 to 19 in the state (Pennsylvania Department of Health, 2009). The County also has the third highest gonorrhea rate and the fourth highest Chlamydia rate among individuals aged 15 to 24 among Pennsylvania's 67 counties. Thus, we focused on a high risk population.

3.2 ELIGIBILITY AND RECRUITMENT

Eligible parents had to be the biological parent (mothers or fathers) or legal guardian of an adolescent male or female between the ages of 11 and 18 years attending the outpatient general pediatric or adolescent medicine clinics of the Univeristy of Pittsburgh Medical Center's Children's Hospital of Pittsburgh. Participants also had to be aged 21 years or older, speak English fluently, and reside in Allegheny County, Pennsylvania.

Participants were recruited in the waiting room at the two study clinics. All parents were handed a study recruitment post card when they checked in for their child's clinic appointment. The postcard provided basic information about the study and directed parents to see a study staff representative who was in the waiting room to obtain additional information about the study. If both a father and mother attended a clinic visit and both parents were interested in participating in a discussion group, they were permitted to do so. Recruitment flyers were also posted in designated locations in each clinic (e.g., waiting area, front desk, study board, restrooms, exam rooms). Both the postcards and study flyers also directed parents to call the study office if they were interested in participating in a discussion group. A study staff person was available by phone to answer potential participants' questions about the study from 8am to 4pm each business day (excluding university holidays) during the entire recruitment period. All recruitment procedures were structured to minimize interrupting routine patient flow.

Upon calling the study office, participants were informed about the study's goals, activities and eligibility criteria using a standardized phone script. Parents who decided to participate were scheduled to attend the next available discussion group. Each participant was mailed a confirmation letter that provided them with details regarding the location of the discussion group, directions to the site, details about travel reimbursement, childcare provision, and study contact information. A study staff member made reminder phone calls to each participant the day before their discussion group session to confirm attendance and answer any additional questions the participants may have had.

3.3 DATA COLLECTION

Seven focus groups were held at Magee Womens Hospital. On average, six participants attended each focus group (range: 2 to 12) and groups lasted 1.5 to 2 hours. Groups were held on weeknight or weekend days to accommodate parents' schedules. Each group was facilitated by two moderators trained in qualitative methodology. At each session, the moderators greeted parents as they arrived. Parents were asked to sign in on a pre-printed sign-in sheet. Participants were then directed to the room where the group discussion was to be held. Prior to engaging in the focus group discussion, participants were asked to complete a brief questionnaire to assess their demographic information. Once all the participants had arrived and completed the questionnarie, the primary moderator welcomed participants, introduced all study staff who were present, explained the study goals and activities, and obtained group verbal permission to audio-record the session using a standardized introduction script. We did not obtain *written* informed consent from participants because: 1) this study involved no more than minimal risk, 2) we were

not collecting identifiable information, and 3) the only document that would link subjects to the research would be the consent. Each participant was provided with food during the group discussion. Each participant received a $25 WePay card. Each participant also received a bus token or a parking pass to exit the facility.

3.3.1 Focus Group Methods

Focus group participants were asked the following question: "What interactive features would you like to see in a web based program to help you talk with your kids about sex?" To initiate the discussion participants were asked to provide feedback on an Ask the Expert tool and chat rooms. Each discussion was facilitated by two moderators. The primary moderator was a Caucasian, bachelor's level female project coordinator with more than 8 years experience conducting research on adolescent sexual and reproductive health. She also had 8 years of experience performing qualitative research studies using a variety of qualitative techniques including individual interviews, focus groups, nominal group technique, and brief motivational interviewing counseling for research purposes. The second facilitator was a Black master's level public health graduate student with experience doing adolescent sexual and reproductive health research and program implementation. The secondary moderator took detailed notes during the discussions, operated the audio-recorder, and took detailed notes documenting participant's nonverbal language (e.g., mood of the group, participants' body language).

After each study session, the moderators and principal investigator debriefed about the interview process, discussed whether revisions to the discussion guide were needed, and compared emergent themes to determine whether thematic saturation had been achieved

regarding desired features of a web intervention. Thematic saturation was achieved after the third discussion group. The fourth and subsequent groups were held to confirm that no new major themes would arise.

3.3.2 Protecting Confidentiality

All collected data were anonymous. Parent questionnaires were identified using a unique identification number that was not linked to any identifiable information. Because of the group format of focus groups, the identity of participants could not be hidden from other participants. In an effort to ensure the confidentiality of participants, the following steps were taken:

(1) Participants were asked to take a confidentiality pledge stating they understood that they might hear information that others consider sensitive and that the information shared should not be disclosed outside of the study setting;

(2) Participants were encouraged to use fake names for identification purposes;

(3) Audio-tapes were transported in a locked case to and from focus group sites and stored in a locked file cabinet;

(4) Once the data were transcribed and analyzed, the audio-tapes were destroyed;

(5) No identifying information (e.g. names) was recorded in the written transcripts; and

(6) Transcripts were kept on a password protected server.

3.4 DATA ANALYSIS

All focus groups were digitally audio-recorded, transcribed and entered into Atlas.Ti, a qualitative data management program. We used a grounded theory approach to content analysis and the constant comparison method to identify emergent themes within and across discussion groups regarding the interactive features of a website parents wanted to see included in the intervention. Because our goal was not to actually develop theory, we did not use grounded theory in the strict sense of the term. Rather, we used the methodological approach to content analysis described by Strauss and Corbin (1998). This coding process involved three steps. First, the written text was reviewed line-by-line to identify relevant themes. This *open coding* process resulted in a list of interactive features. Coders then met as a team to perform *axial coding*, where the broad list of interactive features was reviewed and condensed into a codebook that organized these interactive features into categories with definitions. In the last step, the two coders independently recoded each transcript using the codebook. This process was performed to capture the entire range of comments participants made about each interactive feature. Coders met to review the coded transcripts and resolve discrepancies in the final coding process via consensus.

4.0 RESULTS

4.1 PARTICIPANT DEMOGRAPHICS

Participant demographics are presented in Table 1. The majority of participants were women (86%) and African American (66%). More than half of participants (55%) were single and one-third (29%) had attended some college.

Table 1. Participant Demographics

Characteristic (N=29)	**n (%)**
Gender	
Women	25 (86)
Men	4 (14)
Race/Ethnicity	
White	8 (28)
Black	19 (66)
Hispanic	--
Other	2 (6)
Marital Status	
Single, Never Married	16 (55)
Married	5 (17)
Widowed	1 (4)
Divorced	3 (10)
Separated	4 (14)
Education	
High School/GED	11 (39)
Some College, No Degree	8 (29)
College/ Graduate Degree	9 (32)

4.2 OVERVIEW OF DESIRED INTERACTIVE FEATURES

Parents identified four major interactive features during the focus group discussions: Ask the expert, Chat Rooms, Supplementary Information Delivery Modes and Links to Face-to-Face Programming.

4.2.1 Ask the Expert

Parents were almost unanimous in their approval of an 'Ask the Expert' tool, a resource where parents could express their questions/concerns and receive answers from and 'expert'. Parents had varying opinions regarding who should serve as the expert. Some participants believed that health professionals were best suited to serve in the role. One father commented, "*You should have someone like a doctor or someone on there*", "*like doctors, pediatricians [or] something like that"*, *"just people who teach at the junior college or at school but teach sex education. They don't have to be doctors, just health educators."* Other participants believed that parents would be a more appropriate resource. As one mother stated, *"You could change it out, you know you might have a certain amount of parents every month do the expert thing. You know what I mean? Because everybody has a talent."* Another mother agreed, suggesting that parents could serve as experts through a hotline:

> *"Did you ever think about maybe having some parents volunteer to have a call-in? A call-in hotline where—I'm not saying that they need to be skillfully trained. I'm not saying nothing along that sort of nature but where you could just be a listening ear to another parent and say well this is what I've experienced but you have to make the best judgment call for your own."*

4.2.2 Chat Rooms

Parents also expressed great interest in online communication portals such as chat rooms. Parents believed that a chat room would provide a great space to build virtual support networks, allowing parents to share their experiences and learn from one another. They envisioned the chat room as a place to share situations, how they were managed and the impact on their children. One mother commented:

> *"Because I guess between a blog and a chat room those could [be a way] you could communicate with other parents. Just get their views or thoughts on different things, because some people may have you know been through other things that other people haven't even experienced yet."*

Similarly, one mother remarked that a chat room could be used as a way to discuss ideas and tools for how to educate her children:

> *"Like they can go there and say, 'Well you know this didn't work for me', you know for whatever reason and you know like it's something that might help somebody like they read it and say, 'You know I was thinking about talking to my kids that way and this didn't work for that parent, maybe you know I should try some other way."*

4.2.3 Supplementary Information Delivery Modes

Parents expressed interest in having the online program offer information via other forms of communication, such as text messages, email alerts, and even snail mail. These supplemental information delivery modes would make it easier to share the information with others. For example, one mother commented that a text messages could be easily shared with other parents in her social network:

> *"[Say] I'm not too comfortable with talking to my kid about sex and everyone knows I'm not comfortable. They might get a text and hey, it gets forwarded it to me. I might be ok and just forward it to someone else. The big thing right now is the mass text; chain text messages, you know."*

Another mother echoed this sentiment saying*, "You be like, oh guess what I heard, I'm texting this one."*

For some parents, smaller media was a preferred method of information retrieval over websites. Thus, it was suggested that the information delivery platform be structured so that information could be easily accessed via either mode. For example, a father agreed pointing out that he preferred texting to a fully online intervention, *"I'd be more apt to check my text messages before I go on the computer."* Still others said it might be more convenient to receive information via old-fashioned 'snail mail'. As one mother commented, *"Some people don't have access to email and text, so maybe mailing you know some brochures and stuff."*

Parents acknowledged that they would also like to receive new information via these additional forms of technology tools. They brainstormed how often they'd want to receive information updates. As one mother suggested, *"I think I'd want to see like maybe a monthly or weekly topic or something like that. Like say this week's topic is picking a healthy mate and next week's topic might be the icebreaker you know."*

4.2.4 Links to Traditional Face-to-Face Programming

Although parents expressed great interest in online support networks, there was universal interest in having the online program connect parents to face-to-face programs. One mother indicated her desire that "*the website tell [us] where other sessions where small groups of parents would come*

together to talk about issues and be able to share." Parents suggested that these groups could take the form of a seminar, linking them to professionals. One mother wanted to see, *"somewhere you can go to with like a big group. You know how people they be having seminars about certain things."* Another mother agreed, "*I think it would be nice to have—whether it's a little luncheon or whatever where it's parents and it's that expert—say we got a psychologist, a pediatrician, a therapist—like all those different people that are gonna be sitting on the expert."* One mother spoke of the significance of in-person meetings, *"because what you really looking for is getting back to the link of people. Take the computer out of this situation and we're still people."*

4.2.5 Opportunity for Co-Learning with Adolescent

Although parents understood the goal of the website would be to better prepare *parents* to engage in sexual health discussions with their adolescents, parents continuously stressed their desire to use the website for co-learning with their adolescent. Parents explained that programming to improve adolescents' sexual health knowledge and skills often targeted parents or adolescents separately. This seemed strange to parents given that parents are (usually) a child's first sexual health educator and are the individuals who assess and manage their child's emerging sexuality on a daily basis. One mother commented:

> *"You know our kids are at school learning whatever they're learning…but how many things do we have that are actually interactive for the parents and the kids to do together to bring them together?"*

Another mother echoed this sentiment, *"If we keep doing everything separate it's just going to keep us separate."* Parents believed that the website could give them an indication of where to begin the discussion about sex with their children. For example, one mother suggested that online quizzes would be useful in understanding what sexual health information they needed to discuss with their teens:

> *Wouldn't it be great if the website could have a little section where the kids could come on and take tests and the parent could see where they're children needed help with or what information they had or didn't have? Because you can't, you know like we all realize we can't just assume that what our kids… what they know. Wouldn't it be great if the kids could have something, just a little something on the website?"*

In addition to using the website as an educational resource for teens, parents also commented that their children could benefit from an Ask the Expert tool, *"You might have somebody that already [has] an STD…instead of asking their parent they could go on there and say, 'Well, this is what I'm feelin' and they can ask the expert."*

Parents were also interested in videos or online resources that they could use with their adolescents, *"You could have a video with a different topic--you can choose the one that you want to watch. It could be how to properly use a condom."* One mother commented about having access to downloadable learning materials, *"like age appropriate materials, books you can read with your child."*

Parents also expressed interest in having a support hotline for teens to help facilitate discussions with their children. As one father suggested, "*they have the hotline…but actually like people can call and actually get them to you know…we can talk this way…we talk with your parents, bring [them] in you know…or just discussion.*"

5.0 DISCUSSION

The present study aimed to identify parents' preferences regarding interactive features of a web-based program to improve parent-adolescent communication about sex. Parents identified four types of interactive components for the web program: Ask the Expert, Chat Rooms, Supplementary Information Delivery Modes and Links to Face-to-Face Programming. Parents expressed their desire for individualized feedback and connection to online and offline peer support networks. In addition, parents recommended that the website be supplemented by other types of small media communication tools (i.e. texts, email and mail). Lastly, parents stressed that the web intervention include components for co-learning with their children.

These recommendations are consistent with components of web programs associated with increasing intervention effectiveness. For example, Webb et al. (2010) developed a coding scheme to assess the mode of delivery of 85 internet-based interventions and the influence of delivery mode on the effect sizes of the interventions. The authors developed three categories to describe the mode of delivery of web-based programs: 1) *automated functions* (testimonials, videos, automated tailored feedback, reminders, tips newsletters); 2) *communicative functions* (ask the expert, peer-to-peer discussion boards, forum, or live chat) and 3) *supplementary modes* (email, telephone, text, CD-ROM). They concluded that communicative functions, specifically access to an advisor for advice and supplementing online content through texts produced the

greatest effects among interventions. These findings support parents' desire for an Ask the Expert tool and the inclusion of information via other forms of communication.

A second highly ranked interactive feature in our study was peer-support functions, such as chat rooms. Although not significant in the Webb study, research demonstrates that web-based peer support groups enhance the effectiveness of internet health promotion programs. Neve et al. (2010) conducted a systematic review of web-based interventions on weight loss and found that among studies which examined an association between intervention effectiveness and peer support functions, chat room attendances and bulletin board posts were associated with greater weight loss or weight loss maintenance. Similarly, Letho and Oinas-Kukkonen (2011) conducted a systematic review of internet-based substance use prevention programs to analyze persuasive system features consistent among alcohol and smoking cessation programs. Findings indicated that the most common social support features among programs were peer discussion forums and chat rooms.

What is unclear from this research is who should lead discussions in these peer-support tools. Whether they should be moderated by experts or user-driven, moderated versus unmoderated, synchronous versus asynchronous, or open access versus restricted access has not been explored (Letho and Oinas-Kukkonen, 2011). These considerations were not addressed in the two previously mentioned web-interventions targeting parent-adolescent communication about sex. However, in this study, parents expressed interest in online support-groups led by both parents and experts. There is a certain logic in the desire to have both perspectives. Experts can provide up-to-date information, referrals, and data driven expertise. Other parents, however, role model or provide anticipatory guidance. Thus, the answer to the question of who should lead these groups may be 'both'.

Surprisingly, although participants in our study were highly interested in online learning and virtual support networks they also remained interested in traditional face-to-face programming. This is an indication of parents' strong desire to be physically connected to other parents and health professionals. Parents want to hear what other parents are doing and experiencing and to share these stories or raise concerns in an open forum. Health professionals may offer an added source of guidance and encouragement. Seminars and support groups should be explored as accompanying intervention strategies.

Parents' recommendation for the inclusion of children in the web program cannot be ignored. Parents acknowledge that they may not know everything about their child and that web features such as an online quiz, may provide direction about where to begin the discussion. In addition, it is evident that parents value the opportunity to share the learning process with their adolescent. Learning is a reciprocal process and co-learning may enhance the learning environment. Parents' recommendation to use the site for co-learning with their adolescents is a desire that has not been addressed in existing programs.

5.1.1 Implications for Health Communication Theory

Because of the exploratory nature of this study, a grounded theory approach was used to interpret the research findings. Future studies should also examine how evidenced based theories can be used to interpret research findings and inform the interactivity of web-based interventions. Traditional face-to-face programs have been guided by health behavior theories such as the Social Cognitive Theory (Bandura, 1986) and the Theory of Planned Behavior (Ajzen, 1991). However, given the web-based platform of the proposed intervention, health communication

theories may offer added insight to intervention development. Therefore, successful web-based health interventions must integrate constructs from both health behavior and health communication theories. Fishbein and Yzer (2003) support this approach. The authors propose the use of the integrative model of behavioral prediction (changing beliefs with respect to a particular behavior) and media priming theory (strengthening the association between beliefs and outcomes) as complementary strategies to develop messages to target health behaviors. While the authors demonstrate the usefulness of this approach for message development, the use of this approach for mode of delivery of interventions remains unexplored.

5.1.2 Study Limitations

Several limitations are present in the current study. First, our study included a large proportion of educated parents compared to parents in the County population. In addition, our study was conducted amongst an urban population. Thus, our findings may not be representative of the general population. Second, our sample represented a larger proportion of mothers than fathers which may have affected our results. However, responses among participating mothers and fathers were consistent across all focus groups. In addition, it should be noted, that this study is highly theoretical, parents did not comment on an actual program. Therefore, interventions incorporating parents' suggestions should be developed and tested to determine if parents would actually use the interactive features that they recommended. Third, given the format of the focus group discussion, participants may have felt pressured to give similar answers as their peers rather than present their own opinions. However, because parents did not comment on an existing program, there was little bias from this affect.

The findings from this study are just one of many sources of data that can be used to impact intervention development. Future research in this area should also explore adolescent preferences for interactive features, given parents' overwhelming desire for a paired learning intervention. Furthermore, our study did not identify differences between mothers and fathers regarding their preferences for interactive features, nor did we identify if parents wanted different interactive features based on the race/ethnicity, age and gender of their child. The diversity amongst youth may impact parents' preferences.

6.0 CONCLUSION

Adolescents experience a disproportionate number of sexually transmitted infections (STIs) and unintended pregnancies. Parent-child sexual health communication programs are associated with delayed sexual initiation, increased condom and contraceptive use and fewer negative health outcomes among adolescents. Web-based programs have the potential to reach a large number of parents, thus equipping a greater number of parents with the knowledge and skills to influence adolescent sexual health behavior. Parents in our study recommended a variety of interactive features to include in a web-program to improve parent-adolescent communication about sex: an Ask the Expert Tool, Chat Rooms, Supplementary Technology Tools and Links to Face-to-Face Programming. Parents also suggested that the web intervention include a component for youth. Understanding what parents want can help optimize learning and satisfaction among program participants. Interventions should be developed and tested to determine what interactive features parents would actually use.

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