

Tweeting About Testing: Do Low-Income, Parenting Adolescents and Young Adults Use New Media Technologies to Communicate About Sexual Health?

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CONTEXT: Little research exists about adolescents' and young adults' use of new media technologies to communicate about sexual health. Understanding how young people at high risk for STDs use these technologies can inform media-based interventions.

METHODS: Between October 2010 and March 2011, a sample of 94 low-income, parenting adolescents and young adults recruited at clinics in Connecticut completed an audio computer-assisted self-interview about their use of media technologies, communication with friends about sexual health and willingness to use media technologies for such communication. Descriptive statistics were calculated; characteristics of those willing and those unwilling to communicate were compared in chi-square, *t* and Mann-Whitney tests.

RESULTS: Ninety-three percent of participants had mobile phones; 71% used Facebook regularly. Participants discussed sexual health more often with close friends than with casual friends, and preferred to have such conversations in person (71% with close friends and 68% with casual friends), over the phone (52% and 45%) or via text message (30% and 28%), rather than through social networking sites (0–9% and 2–7%). Fewer than one-third reported being willing to share sexual health information with friends through a specific new media technology. Those who were willing were predominantly black (59%); of those who were unwilling, 51% were Latino. Condom self-efficacy, STD knowledge and number of Facebook friends were greater among those who were willing than among those who were unwilling.

CONCLUSIONS: For conversations about sexual health, young urban parents prefer private forms of communication; thus, social networking sites may not aid STD interventions.

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To promote sexual health among adolescents and young adults, many health organizations are turning to new media—the Internet, social networking sites and mobile phones—to disseminate information and stimulate conversations about health topics. This innovative approach to health communication has the potential to reach a large audience and trigger dialogue about sexual health attitudes and norms. However, little research exists to inform the design of such interventions. To create an effective, new media-based intervention to promote sexual health, it is essential to understand how adolescents and young adults use new media. The current study investigates communication about sexual health among low-income, parenting adolescents and young adults, a population that is at high risk for STDs.

BACKGROUND

Adolescent and Young Adult Sexual Health

Behavioral, biological and cultural characteristics put sexually active adolescents and young adults at greater risk of acquiring STDs than older adults.¹ Though 15–24-year-olds represent only one-quarter of the sexually active population, they acquire nearly half of all new STDs.² Moreover, black and Hispanic adolescents and young

adults are disproportionately likely to receive diagnoses of HIV and other STDs.² Despite young people's disproportionate risk of acquiring STDs, regular testing is not widespread. Only one-third of sexually active teenagers and half of sexually active young adults report ever having been tested for STDs.³

Teenage pregnancy continues to be a pressing concern, particularly among racial minorities.⁴ By age 20, some 32% of Latinas and 24% of black women have had a live birth, compared with 11% of white and Asian American women.⁴ Pregnant and parenting adolescents and young adults have an especially high risk for STDs: Between 19% and 39% of adolescents contract one during pregnancy, and 9–39% of adolescent mothers contract an STD 6–12 months postpartum.^{5–8} Therefore, young minority parents represent a high-risk population in need of effective prevention interventions.

Promoting Sexual Health Through New Media

The growth of information and communication technologies in the United States since the 1990s, and the ubiquitousness of mobile phone and Internet use, has expanded the options for delivering health interventions. A vast amount of health and medical information exists online,

and 61% of adults aged 18 years and older regularly use the Internet to find it.⁹ In the last five years, mobile phones have begun to be used in similar ways. Moreover, text messaging has been used to remind patients about appointments, increase adherence to medication regimens, educate people about health issues, promote preventive behaviors and, in some circumstances, even conduct partner notification regarding STD testing.^{10–17} New media have the potential to reach communities that have relatively poor access to health education and health care, which are the frequent targets of behavioral interventions to reduce STD risk.

These technologies are especially well suited to young people for several reasons. Adolescents and young adults are frequently early adopters of new technologies,¹⁸ and use is widespread among them. Three-quarters of 12–17-year-olds own mobile phones, and 88% regularly text message; 14–17-year-olds typically send and receive as many as 60 text messages a day.^{19,20} Thus, researchers and health organizations can use these communication technologies to reach adolescents directly.

The growing popularity of smartphones has increased Internet access to health information: Twenty-nine percent of 19–29-year-olds have used their mobile phone to look up health or medical information, and 15% have a mobile health application, or “app,” specifically designed to help them track or manage their health (e.g., by encouraging treatment adherence).^{19–21} A handful of organizations are already using mobile phones to promote education about sexual health. For instance, the San Francisco Department of Public Health has partnered with the nonprofit Sexuality Information Services to create a text message service that promotes awareness of gonorrhea among black adolescents in San Francisco.²² Participants opt in via text message to receive information about topics such as pregnancy, HIV and the decision to have sex. The program, having reached its target audience, has been considered culturally acceptable.

In the last few years, some health organizations have begun to use social networking sites, such as Facebook, MySpace and Twitter, to conduct health campaigns and interventions. Social networking sites are popular among adolescents: Almost three-quarters who use the Internet regularly use sites like Facebook and MySpace.¹⁸ Furthermore, some sites (e.g., Facebook, Foursquare and Gowalla) include geolocation mobile applications, which allow users to tell friends of their current location, such as an STD clinic,²³ and therefore encourage conversations about STDs and related topics.

Health organizations can use social networking sites not just to educate people about health issues, but also to change related norms, stigmas and beliefs.²³ Because these sites rely on peer-to-peer networking, they may be able to promote behavioral change in the same way that off-line peer networks do.^{24,25} On this assumption, in 2010, MTV and Foursquare, in partnership with the Kaiser Family Foundation, the Centers for Disease Control

and Prevention, and the Planned Parenthood Federation of America, created a social networking geolocation campaign to promote STD testing and reduce its stigma by facilitating online conversations about it.²⁶ The program encouraged users to publicly “check in” (identify that they were at an STD clinic) via Foursquare and announce to their social networks that they had gotten tested. Results of the campaign have not yet been released.

Similarly, in the same way that programs have used popular opinion leaders to influence health behaviors through face-to-face interactions,^{27–31} interventions could use popular opinion leaders to promote sexual health through their online networks. However, little is known about the potential of these leaders to promote sexual health using social media.

The Current Study

Several groups, including the Kaiser Family Foundation and the Pew Research Center, track general new media consumption among adolescents and young adults. However, no research, to our knowledge, has examined how these young people use new media technologies to communicate about sexual health; understanding the ways in which they communicate with each other about sexual health is important for developing interventions that use new media to address related social norms and stigmas.

Because sexual health topics tend to be more sensitive and stigmatized than other topics of conversation, it is important to understand which ones adolescents and young adults feel comfortable discussing via new media technologies, and within which social groups. For example, adolescents’ and young adults’ potential willingness to discuss birth control but not STDs with their friends on MySpace may affect the success of new media-based sexual health interventions. Similarly, if adolescents and young adults are willing to discuss sexual health topics with close friends, but not with casual friends, an intervention that encourages participants to post updates on Facebook about their sexual health status might not be as successful as one that encourages participants to send private messages to individual friends.

The current study investigates how low-income, parenting adolescents and young adults—a subpopulation at especially high risk for STDs—use new media to communicate about sexual health with close and with casual friends. It describes young parents’ willingness to receive and share sexual health information with peers via new media technologies, as well as the differences between those who are willing to communicate this way about sexual health and those who are not.

METHODS

Study Population

Data for this study came from a larger, longitudinal study of how the transition from pregnancy to parenthood influences relationships, as well as sexual and reproductive

health, among young couples. The current sample includes all 94 participants (50 females and 44 males) who completed a follow-up interview between October 2010 and March 2011.

Participants were recruited from obstetrics and gynecology clinics and an ultrasound clinic in four hospitals in three cities in southern Connecticut. Young women at prenatal care appointments were referred by health care providers or approached directly by research staff. Research staff screened potential participants, explained the study in detail to those who were eligible and answered their questions. If the man with whom a woman conceived was not present at the time of screening, research staff asked for permission to contact him to explain the study or gave the woman informational materials for him and asked her to talk to him about the study. Staff phoned women and their partners to answer any questions and schedule a baseline interview.

A woman was eligible to participate if she was aged 14–21 at the time of the interview, in the second or third trimester of pregnancy, biologically responsible for the pregnancy and romantically involved with the man with whom she conceived. A man was eligible if he was at least 14 at the time of the interview, romantically involved with a woman who was in the second or third trimester of pregnancy and biologically responsible for the pregnancy. Both partners in a couple had to be willing to participate in the study and fluent in English or Spanish. Researchers secured informed consent.

Procedures

Participants completed structured interviews via audio computer-assisted self-interviews. With this approach, respondents listen through headphones to questions that have been digitally recorded and stored on a computer, and see the questions displayed on the computer’s screen. This technology helps participants who have low reading skills complete psychological and behavioral tests and elicits more accurate responses to sensitive questions than does face-to-face interviewing.^{32,33} We created a module on social network and technology use, which was added to the study after participants had already been enrolled. Participants completed the module at their first follow-up—six months or 12 months postpartum. Because participants were all young parents, and no association was expected between the primary variables and the length of time since delivery, we had no reason to anticipate differences between these two time points. To test this, we compared mobile phone use, willingness to communicate through new media, age, race and gender between those who completed the module at six months and those who completed it at 12 months. We found no differences for any of these variables ($p > .05$).

Participants received \$25 for the baseline interview, \$25 for the six-month postpartum follow-up and \$50 for the 12-month follow-up. All procedures were approved by the Human Investigation Committee at Yale University and by the institutional review boards at all hospitals.

Measures

•**Use of new media technologies.** Participants were asked which mobile phone capabilities they used weekly. Options were make phone calls, send text messages, send multimedia text messages, check e-mail, go on the Internet, use a global positioning system, and download and run applications. They were asked the average number of minutes they spent per day talking on their mobile phones, and the number of text messages they sent and received daily (with an upper limit of 999 for each).

Participants were also asked which social networking sites they used at least once per week, their number of weekly log-ins for each site and their number of friends or followers on each. Options were Bebo, Blogger, Facebook, Facebook Places, Foursquare, Friendster, Google Buzz, Google Latitude, Gowalla, Habbo, LinkedIn, LiveJournal, MySpace, SCVNGR, Twitter, Xanga, other and none.

•**Communication about sexual health.** Participants were asked how often they talked with close friends and with casual friends about seven sexual health topics: birth control, condoms, STDs, STD testing, HIV and AIDS, “hooking up” and “cheating.” Responses were scored on a scale of 0 (never) to 4 (very often). Participants who reported talking often or very often about a topic were grouped together; those who reported talking sometimes, rarely or never were collapsed into another group.

The survey also assessed preferred modes of communication for conversations about sexual health with both close friends and casual friends. Options were talking in person, talking on the phone, text messaging, instant messaging, e-mailing, posting a public message on one’s social networking profile, posting a public message on a friend’s social networking profile and sending a private message through a social networking site. (We assessed the three methods of communicating through social networking sites separately because they afford varying levels of privacy.) Participants could check multiple options.

•**Willingness to receive and share information.** Participants were asked, “If a health organization could send you weekly tips about relationships, safer sex, STDs or birth

TABLE 1. Measures of mobile phone activities among a clinic-based sample of low-income, parenting adolescents and young adults, Connecticut, 2010–2011

Activity	% or median (N=87)
Weekly percentage	
Make phone calls	88.5
Send text messages	85.1
Access Internet	62.1
Send multimedia text messages	62.1
Check e-mail	56.3
Run application	31.0
Use global positioning system	25.3
Daily median	
Minutes spent talking (range, 0–999)	30.0
Text messages sent (range, 0–999)	36.0
Text messages received (range, 0–650)	40.0

control, how would you prefer to receive those tips?" Options were text message, e-mail, a public message on a social networking site, a public message on one's own profile on a social networking site, a private message through a social networking site and "I don't want to receive tips at all." Participants could check multiple options.

Additionally, participants were asked how strongly they agreed with the following four hypothetical scenarios: "If I were to get tested for STDs, I would be comfortable sharing that I got tested on a social networking website"; "If a health organization were to send me tips about sexual health, I would share them on a social networking website"; "I would feel comfortable 'checking in' at a sexual health clinic on a geolocation 'app'"; and "If a health organization were to text me tips about sexual health, I would text them to my friends." Responses were scored on a scale of 1 (strongly disagree) to 5 (strongly agree). Participants who agreed or strongly agreed were grouped together; those who disagreed, strongly disagreed, or neither agreed nor disagreed formed another group. We classified the former as willing to communicate about sexual health through new media technologies, and the latter as not willing to do so.

•Sexual and psychosocial variables. Participants were asked if they had ever received a diagnosis of chlamydia, gonorrhea, herpes, human papillomavirus, syphilis or trichomonas. Condom attitudes were assessed on a nine-item scale adapted from the UCLA Multidimensional Condom Attitudes Scale. Responses ranged from 1 (strongly disagree) to 7 (strongly agree). Items were summed; higher scores indicated more positive condom attitudes. Results showed good internal consistency (Cronbach's alpha, 0.74).³⁴ Condom self-efficacy was assessed on a 17-item scale adapted from the Condom Use Self-Efficacy Scale, which assessed participants' confidence in using condoms and communicating about

TABLE 2. Measures of weekly use of social networking sites among low-income, parenting adolescents and young adults

Site	% who use (N=94)	Median network size†	Median weekly log-in†
Facebook	71.3	250.0 (0–3,000)	7.0 (0–200)
MySpace	21.3	175.0 (0–1,200)	2.7 (0–15)
Twitter	8.5	7.5 (0–592)	1.0 (0–6)
Facebook Places	7.4	250.0 (0–3,000)	7.0 (0–15)
Google Buzz	6.4	1.5 (0–6)	0.5 (0–3)
Google Latitude	1.1	100.0 (100)	5.0 (5)
None	14.9	na	na

†Among users. Notes: No participants reported using any other sites. Facebook and Facebook Places utilize the same network, so the question about network size was asked only once. na=not applicable.

condom use.³⁵ Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Items were averaged; higher scores indicated greater condom use self-efficacy. Results showed good internal consistency (Cronbach's alpha, 0.90).³⁵ HIV and other STD knowledge was assessed on a nine-item scale adapted from the HIV Risk Knowledge Scale.³⁶ Responses ranged from 0 (definitely false) to 4 (definitely true). Items were summed; high scores indicated greater knowledge. Results showed good internal consistency (Cronbach's alpha, 0.71).³⁶

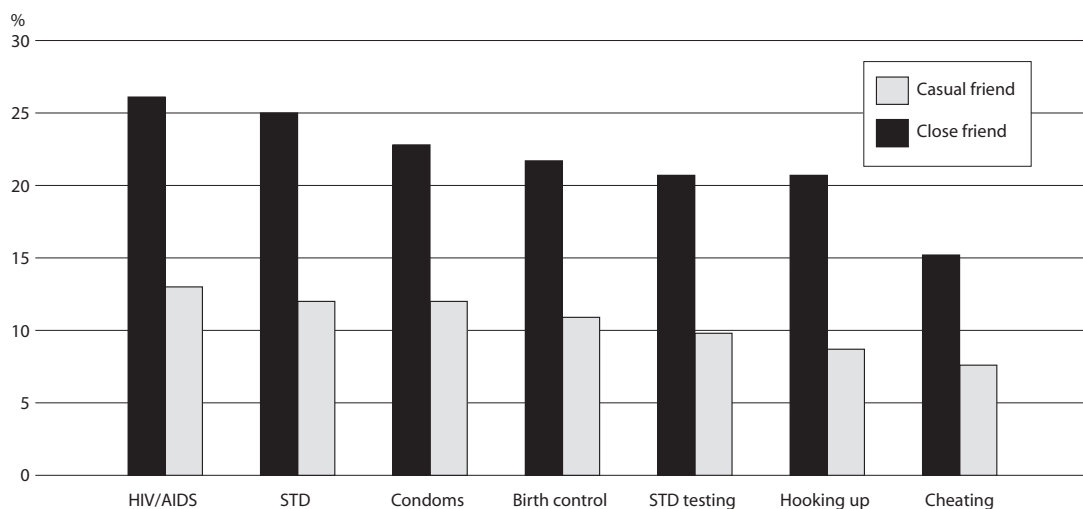
•Demographic variables. Participants were asked their race, gender, age and income.

Analyses

Medians and ranges were calculated for all continuous variables; frequencies and percentages were calculated for all categorical variables. To assess whether participants talked more often about sexual health topics with close friends or casual friends, we conducted a McNemar analysis for each topic.

Several tests were performed to compare demographic characteristics of participants who were willing to communicate about sexual health through new media

FIGURE 1. Percentage of low-income, parenting adolescents and young adults who discuss various sexual health topics with friends, by type of friend



Notes: Based on responses from 92 participants. Difference by type of friend is significant at $p < .01$ for each topic.

TABLE 3. Percentage of low-income, parenting adolescents and young adults who discuss sexual health with close and with casual friends, by preferred mode of having such discussion

Mode	Close (N= 77)	Casual (N = 60)
In person	71.4	68.3
Phone	51.9	45.0
Text message	29.9	28.3
Instant message	14.3	10.0
E-mail	7.8	8.3
Social networking site		
Post on own profile	0.0	1.7
Post on friend's profile	2.6	1.7
Private message	9.1	6.7

technologies with those of participants who were not willing. For categorical variables (race, gender and STD history), chi-square tests were performed. For normally distributed continuous variables (age, condom attitudes, condom self-efficacy and STD knowledge), t tests were performed to compare means. For continuous variables that were not normally distributed (minutes spent talking daily, texts sent daily, texts received daily, number of Facebook friends and number of Facebook log-ins per week), Mann-Whitney tests compared mean ranks.

RESULTS

The mean age of participants was 20 years (standard deviation, 3.4). The sample was predominantly black (46%) and Latino (38%); 13% of participants were white, and 3% reported their race as “other.” Participants reported a mean annual household income of \$14,090 (standard deviation, \$21,459).

Ninety-three percent of participants reported owning a mobile phone. Among these, 89% used their mobile phone at least weekly to make calls, and 85% used it at least weekly to send text messages (Table 1, page 178). Sixty-two percent reported using the Internet, and the same proportion reported sending multimedia text messages; 56% checked e-mail, 31% ran applications and 25% used their phone’s global positioning system at least

weekly. The median number of minutes spent talking on mobile phones daily was 30, the median number of text messages sent was 36 and the median number of text messages received was 40.

The most commonly used social networking site was Facebook, which 71% of all participants used at least weekly (Table 2, page 179). The next most commonly used social network was MySpace, though only 21% of participants reported using it at least weekly.

Network size and number of weekly log-ins for each social networking site varied widely. The median number of Facebook friends among Facebook users was 250, and the median number of log-ins per week was seven. The median number of MySpace friends among MySpace users was 175, and the median number of log-ins per week was about three.

Overall, fewer than one-third of participants reported talking often or very often with friends about each sexual health topic, although significantly more participants reported talking about each topic with close friends than with casual friends (Figure 1, page 179). Participants who communicated with close or with casual friends about sexual health topics preferred to have such conversations in person (71% with close friends and 68% with casual friends—Table 3), over the phone (52% and 45%) or via text message (30% and 28%). Very few preferred to use social networking sites (0–9% and 2–7%).

When asked which modes of communication they would prefer for receiving sexual health tips, 45–46% of participants selected text message or e-mail (Table 4). Few indicated a preference for receiving sexual health tips through social networking sites, and 14% said they did not want to receive sexual health tips at all.

Thirty-five percent of participants reported that they would be willing to text message sexual health tips to friends; 20% said they would share sexual health tips with friends through social networking sites. Sixteen percent said they would use a geolocation application to publicly check in to an STD testing center; 15%, that they would share through a social networking site that they had had an STD test.

Forty-two percent of participants were willing to communicate about sexual health through new media technologies, and this group differed in a number of ways from those who were not willing (Table 5). Race was associated with willingness: Blacks made up the largest proportion of adolescents who were willing to communicate about sexual health through new media technologies (59%), and Latinos the largest proportion of those who were unwilling (51%). Those willing to communicate had greater condom self-efficacy, greater STD knowledge and more Facebook friends than those who were unwilling.

TABLE 4. Percentage of low-income, parenting adolescents and young adults who discuss sexual health, by preferences for receiving and sharing sexual health tips through new media technologies

Preference	% (N=94)
Receiving	
Text message	45.7
E-mail	44.7
Social networking site	
Public message	5.3
Post on own profile	3.2
Private message	3.2
Do not want to receive tips	13.8
Sharing	
Text message	34.8
Post on social networking site	19.5
Use geolocation application to check in at STD clinic	16.3
Announce STD test on social networking site	15.2

DISCUSSION

Although almost all low-income, parenting adolescents and young adults in the sample regularly used new media technologies, including text messaging and social

TABLE 5. Selected characteristics of low-income, parenting adolescents and young adults, by willingness to communicate about sexual health through new media technologies

Characteristic	Willing (N=39)	Not willing (N=55)
PERCENTAGE DISTRIBUTIONS		
Race		
Black*	59.0	36.4
Latino	20.5	50.9
White	15.4	10.9
Other	5.1	1.8
Gender		
Women	43.6	49.1
Men	56.4	50.9
STD history		
Yes	30.8	32.7
No	69.2	67.3
Total	100.0	100.0
MEANS		
Age		
	20.2 (4.2)	19.8 (2.8)
Sexual/psychosocial		
Condom attitudes (range, 9–63)	45.3 (3.5)	42.8 (4.4)
Condom self-efficacy (range, 1–5)**	4.2 (0.5)	3.8 (0.6)
STD knowledge (range, 0–36)*	31.2 (3.5)	29.4 (4.4)
MEAN RANKS		
New media technology use		
Minutes spent talking daily (range, 0–999)	47.2	46.0
Texts sent daily (range, 0–999)	49.0	44.6
Texts received daily (range, 0–650)	47.5	45.8
Facebook friends (range, 0–3,000)**	56.9	40.8
Facebook log-ins per week (range, 0–200)	48.7	46.6

* $p < .05$. ** $p < .01$. Notes: Differences by willingness were assessed through chi-square tests for percentages, t tests for means and Mann-Whitney tests for mean ranks. Figures in parentheses are standard deviations.

networking sites, they preferred to have conversations about sexual health privately, in-person or over the phone. Text messaging was the most popular technology used to talk about sexual health, but it was not widely used. Very few participants had such conversations through social networking sites. For receiving sexual health tips, participants preferred text messaging and e-mail.

Health organizations should consider these findings when designing new media-based interventions to promote sexual health. Media technologies may be better suited to increasing access to information and services than to encouraging conversations about changing sexual attitudes and behaviors.

Our results emphasize that before health organizations implement technology-based interventions, they need to understand how adolescents and young adults use communication technologies. For example, barely any participants in this study reported using geolocation applications, even though one-quarter reported using their mobile phone's global positioning system regularly. Consequently, interventions such as the campaign to check in to STD clinics using geolocation applications might not reach high-risk low-income urban populations.²⁶

We found that participants talked more often with close friends than with casual friends about all seven sexual

health topics assessed in this study. This result is consistent with research that shows that close ties in social networks are more strongly associated with health behaviors than are weaker ties.^{37,38} Furthermore, our findings are consistent with research that shows that individuals are more likely to communicate about sensitive subjects privately with close friends than publicly with close or with casual friends.³⁹ The low reported use of social networking sites to discuss sexual topics may reflect these preferences. Of all participants who were unwilling to discuss sexual health through new media technologies, more than half were Hispanic; more research is needed to understand the possible reasons for these differences.

These results suggest caution as well as promise in adopting new technologies to implement sexual risk reduction interventions. Our sample of low-income parents used mobile phones regularly for calls and text messaging; that more than half used their phones at least weekly to access the Internet and e-mail suggests that a large proportion had smartphones, despite their socioeconomic disadvantage. Thus, when designing sexual health interventions for high-risk populations, public health organizations should not assume that those who are low-income have limited access to new media technologies. In fact, this study found greater use of social networking sites and mobile phones than studies of the general adolescent population have documented.^{18,19}

Another promising result was that although most participants were not comfortable communicating about sexual health through new media technologies, some were willing, and this group had higher condom self-efficacy and STD knowledge than others. Those willing to use new media technology to discuss sexual health may therefore make ideal popular opinion leaders in technology-based prevention interventions.

Limitations and Strengths

This study had several limitations. Participants were low-income, primarily minority parents, and therefore are not representative of all adolescents and young adults. Also, they had more access to sexual and reproductive health care than the general adolescent and young adult population, because as part of the larger study, all participants were tested for STDs, and all females received prenatal care. Furthermore, participants' parenting status may have affected their attitudes toward sexual and reproductive health care; however, there is no evidence that parenting status affected reported use of new media technologies.

Another limitation of this study is its reliance on self-reported data; reports of use of new media technology or frequency of conversations might not have accurately represented actual behaviors. Finally, new media technologies evolve rapidly, and social norms about technology use may change in the near future.

The specificity of the study population, while in some ways a limitation, was also a study strength. Young parents

are at high risk for STDs, adverse health outcomes, repeat pregnancies, curtailed education, low income and marital instability.^{6,7,20,40–42} Consequently, these findings suggest areas in which further research might help health organizations target sexual and reproductive health campaigns and interventions to the segment of the population that could most benefit from them. Additionally, this population's use of new media technologies has not been well researched: Most studies on technology, Internet and social media use among adolescents and young people have assessed a cross-section of the population, and not the populations at highest risk.¹⁸

Conclusion

To be effective, a new media-based intervention or campaign must engage audiences and encourage participation. Our findings suggest that social networking sites may not be the ideal platform for changing norms about sexual health. Interventions that use more private technologies may be more suitable for dissemination of sexual risk messages through social networks. However, identifying young people who would willingly discuss sexual topics through social networking sites and other media technologies, and engaging them as opinion leaders, may expand the reach of media-based interventions.

This study is a first step in understanding how low-income, parenting adolescents and young adults use new media technologies to communicate about sexual health topics. As these technologies evolve, more research is needed to explore their potential role in advancing young people's sexual health.

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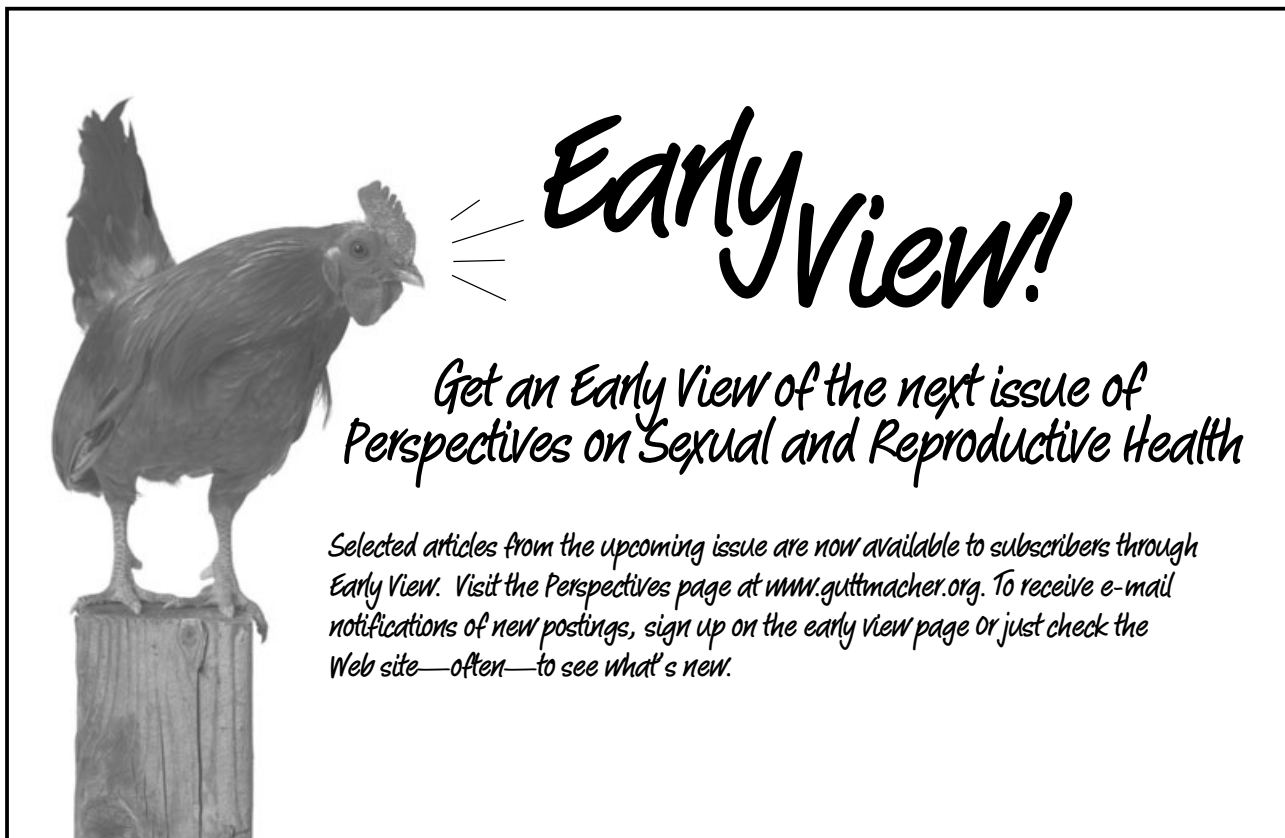
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