Published in final edited form as:

Contraception. 2013 July ; 88(1): 18–23. doi:10.1016/j.contraception.2012.11.016.

Evaluation of e-mail contact to conduct follow-up among adolescent women participating in a longitudinal cohort study of contraceptive use[☆]

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Abstract

Background—The purpose of this study was to determine whether e-mail contact is a viable method for gathering information from adolescent women about contraceptive use.

Study design—Adolescent women initiating contraception followed in a prospective longitudinal cohort study and who had access to the Internet were randomized to the control or intervention arm and were contacted at 3, 6 and 12 months after enrollment. The control arm completed follow-up surveys in-person or by telephone. The intervention arm received Web-based surveys via e-mail.

Results—There were 46 women in each group. Women in both groups were approximately 20 years old, were sexually active minority women, and were in school or employed. While participants in the intervention group initially had lower response rates than those in the control group (59% vs. 91%, respectively), with the addition of traditional follow-up methods, the overall response rates were comparable (94% vs. 91%, respectively).

Conclusions—E-mail follow-up with Web-based surveys was effective amongst adolescent women at risk for unintended pregnancy. This indicates that e-mail contact could be used as a preliminary follow-up strategy to capture a substantial proportion of participants and that standard follow-up can be used as a second-line approach. A two-pronged approach with initial e-mail contact and traditional follow-up for participants who do not respond may be a viable method when evaluating sensitive areas such as contraceptive use.

Keywords

Adolescent women; Contraception; E-mail; Unintended pregnancy; Follow-up

[☆]Clinical trials.gov identifier: NCT00333541.

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1. Introduction

Research is needed to help health care providers optimize the use of contraception by those who are at high risk for unintended pregnancy. Conducting research and collecting follow-up data from participants can be challenging amongst many study populations and are particularly challenging amongst adolescents especially when studying high-risk behaviors. Use of the Internet may be a more efficient and effective approach to conducting research amongst this population. Web-based research has the advantage of relying on fewer resources to collect data compared to in-person or telephone surveys and has the potential to obtain more sensitive information given that the survey is completed privately. The use of e-mail contact to conduct Web-based surveys is a novel approach for obtaining information on contraceptive decision-making and use from adolescent women and may facilitate a greater understanding of this complex issue.

Ninety-three percent of adolescents in the United States aged 12–17 years have personal access to the Internet [1], and the use of Web-based Internet surveys is preferred by adolescents over paper and pencil surveys [2]. Adolescents report more comfort with Internet surveys because they feel they have anonymity when completing an Internet survey as compared to paper and pencil surveys. In addition, they report ease of use compared to paper and pencil surveys as survey completion can happen at their convenience [2–4]. Web-based surveys have been used successfully to evaluate adolescent behavior and decision-making regarding sensitive subject areas such as sexually transmitted infections (STIs) and substance abuse [4,5]. An anonymous survey of patients presenting to an STI clinic found that 57% of adolescents reported that they would be comfortable entering on a secure Web site the date of their last intercourse and whether they used a condom, whereas only 29% would be willing to disclose the same information on a paper survey and 14% would decline to answer [6]. Furthermore, a study evaluating the feasibility of a Web-based surveillance system to collect data on health risk behavior from college students found that using Web-based surveys was less time consuming in terms of data collection and resulted in a higher rate of completion of sensitive items [7]. To our knowledge, the effectiveness of e-mail contact to conduct Web-based surveys for obtaining follow-up information on method continuation among adolescents, minorities and low-income women at high risk for unintended pregnancy who initiate hormonal contraceptives has not been evaluated.

The widespread use of the Internet by youth presents an opportunity to study the feasibility of using e-mail contact for research purposes. The aim of this nested pilot study was to determine whether using e-mail contact to conduct a Web-based survey is more effective than traditional survey administration when used to collect information from adolescent women at high risk of unintended pregnancy enrolled in a prospective longitudinal cohort study of sexual behavior and contraceptive use.

2. Materials and methods

This nested pilot study was conducted from September 2005 to June 2008 within a longitudinal cohort study of 1387 women initiating hormonal contraceptives at four family planning clinics in Northern California in Vallejo, Richmond, East Oakland and Hayward and has been previously described in detail [8].

Participants enrolling in the parent study were invited to participate in the pilot study, which was a randomized, single-blinded, controlled trial designed to evaluate the effectiveness of using e-mail contact to collect follow-up information from adolescent women about contraceptive use and method continuation. This method of follow-up was compared to the method of completing the same Web-based surveys in the parent study, which occurred in

person in the clinic, at a location of their convenience or over the telephone. Participants from the parent study were eligible to enroll in the pilot study if they were English-speaking, had an active e-mail address, were willing to be contacted by e-mail and reported using e-mail at least once per week. After enrollment in the parent study and completion of the baseline survey, women who were eligible and interested in participating in the pilot study provided written consent and were sent an e-mail within 1 day to verify their e-mail address. Participants who responded and verified their e-mail address were enrolled in the pilot study and randomized using a random number generator in blocks of 10 by study site to the control group or the intervention group.

Participants who were assigned to the control group completed follow-up surveys according to the parent study protocol. In the parent study, participants were scheduled to return to the clinic specifically to complete 3-, 6- and 12- month follow-up surveys only. If the participant could not come to the clinic for follow-up, she was offered the option of completing the survey by phone or at another convenient location. The majority of women in the parent study completed follow-up in clinic. In-person clinic follow-up appears to be the preferred method, with 69.3% of participants completing their 3-month follow-up in clinic, 63.2% completing their 6-month follow-up in clinic and 59.8% completing 12-month follow-up in clinic. Participants were called if they did not come to clinic for their follow-up survey. There was no set number of calls made to the participants. The research team attempted contact with the participant by phone numerous times until they reached the participant. Phone follow-up occurred for 17.1% of participants at 3 months, 24.2% at 6 months and 27.8% at 12 months. Once contacted, 10% of participants scheduled a follow-up at a location of their convenience at 3 months, 9.87% at 6 months and 9.8% at 12 months. Participants received \$30 for completing the baseline and 12-month follow-up surveys and \$20 for completing the 3- and 6- month follow-up surveys.

Participants assigned to the intervention group were not scheduled to return to clinic. They were sent an e-mail with a link to the Web-based follow-up survey 2 weeks prior to the due date of the 3-, 6- and 12-month follow-up surveys. Participants in the intervention group were given 2 weeks from the time they were sent the first e-mail to complete the survey online, and up to three reminder e-mails were sent over this time period to participants who did not complete the survey. Those who did not respond within 2 weeks were contacted by a research assistant to complete their survey per the parent study protocol using another method (i.e., in clinic, by telephone or at a location of their convenience). Participants randomized to the intervention group answered additional questions regarding their acceptance of and satisfaction with completing the Web-based survey delivered via e-mail.

Both the parent study and the pilot study were approved by the Committee on Human Research at the University of California, San Francisco. Written informed consent was obtained from study participants prior to enrollment in the parent study, and those who participated in the pilot study provided a second written consent agreeing to be enrolled and randomized in the pilot study. A waiver of parental consent was approved by the Committee on Human Research for enrollment of minors because the study posed minimal risk and because minors can consent to receiving confidential contraceptive services without parental consent under California law.

The sample size was based on previous reports in the literature which demonstrated 10%–30% increase in follow-up rates using e-mail compared with traditional in-person follow-up [9]. We hypothesized that the follow-up rate at 12 months would be 80% in the control group and 95% in the intervention group. Assuming a two-sided $\alpha=0.05$, 76 participants were needed in each arm to achieve 80% power to detect this difference between the control and intervention groups.

Data analysis was conducted with SAS 9.2 (SAS Institute, Cary, NC, USA). Data are presented as proportions or means with standard deviation. Comparisons were made using χ^2 or Fisher's Exact Tests. All tests were two sided, and p values less than .05 were considered to be statistically significant

3. Results

Of 562 participants who were screened for eligibility in the pilot study, 294 (52.3%) were eligible, and 268 (48%) did not meet all of the eligibility criteria which included speaking English, having an active e-mail address, being willing to be contacted by e-mail and reporting using e-mail at least once per week. Verification e-mails were not generated for 14 eligible participants due to programming errors. Of the remaining 280 who were eligible, 73 participants (26%) declined, 115 (41%) did not respond to the verification e-mail, and 92 (33%) responded to the verification e-mail and were enrolled in the pilot study. Reasons for why participants declined were not elicited. It is possible that the eligibility criteria were too liberal given the high rate of nonresponse to the verification e-mail. The proposed sample size was not achieved because the parent study enrollment was completed and thus additional participants could not be screened for eligibility for the nested pilot study. Additionally, a lower response rate than anticipated amongst those who were eligible (33%) resulted in fewer participants enrolled in the nested pilot study. In addition, the high rate of ineligibility for the e-mail study amongst this study population suggests that socioeconomic factors play an important role in determining whether adolescent women have regular e-mail access, with minority and low-income women having less access.

Participant characteristics are shown in Table 1. Participants randomized to the control group or intervention group of the pilot study were similar with the exception of race ($p=.03$), and a higher proportion of women in the control group (50%) reported they were very sure they would continue their contraceptive method for 1 year compared to participants in the intervention group (28.9%) ($p=.04$).

A flow diagram detailing eligibility, inclusion and randomization of the participants is shown in Fig. 1. Participants who were eligible for e-mail follow-up and were enrolled in the pilot study were compared to women who were not eligible, as well as those who were eligible but who did not respond to the verification e-mail and thus were not enrolled in the pilot study (Table 2). Results are presented as means with standard deviation. Women in the enrolled group were slightly older (20.0 ± 2.4 years) than women in the other two groups (19.1 ± 2.4 years), and this difference was significant between the eligible-enrolled and the eligible-not-enrolled groups ($p=.03$). In addition, race differed significantly overall between the eligible-enrolled and eligible-not-enrolled groups ($p=.01$), with a greater proportion of Latina (28.0%) and African-American (46.3%) participants in the ineligible group as compared to the eligible-not-enrolled group (24.7% and 32.9%, respectively) and the enrolled group (20.7% and 23.9%, respectively). Because analysis was conducted using χ^2 to test differences between races, overall differences between racial groups individually were not assessed. Finally, participants in the eligible-not-enrolled group were significantly more likely to be of low socioeconomic status (53.5%) compared to participants in the eligible-enrolled group (32.6%) ($p=.02$).

Among the intervention group, 78.3% of participants completed the Web-based surveys at 3 months, 73.9% of participants completed them at 6 months, and 69.6% of participants completed them at 12 months. Fifty-nine percent of participants in the intervention group completed all three follow-up surveys following e-mail contact. In contrast, among participants in the control group who were randomized to traditional follow-up, 95.7% of participants completed surveys at 3 months, 97.8% of participants completed surveys at 6

months, and 93.5% of participants completed surveys at 12 months. Ninety-one percent of participants in the control group completed all three surveys. Completion rates differed significantly between the intervention and control groups at each time point (all $p < .01$), and completion of all three surveys also differed significantly by group ($p < .001$).

With the addition of standard follow-up protocols for nonresponders in the intervention group, overall response rates for the intervention group increased and were comparable to the control group, with 95.7% of participants completing surveys at 3 months, 95.7% of participants completing surveys at 6 months, 95.7% of participants completing surveys at 12 months and 93.5% of participants completing all three surveys (all $p = 1.00$).

Of the 46 participants randomized to e-mail follow-up, 33 (71.7%) completed questions on acceptance and satisfaction of e-mail follow-up at the end of the final survey. Almost all reported the Web-based survey to be “very easy” to start (97.0%) and “very easy” to take (90.9%). A majority reported taking the survey at home (63.6%) and being alone while they completed it (63.6%). Among participants who were not alone when completing the survey, 75.0% reported that they were not worried that someone would see their answers.

4. Discussion

In our study of adolescent women at risk for unintended pregnancy, use of e-mail contact to conduct Web-based surveys to complete follow-up was feasible and effective. However, many women were not eligible for e-mail follow-up, and many women declined this option. E-mail follow-up was less effective than the standard follow-up used in the parent study. Although the completion of surveys at each of the follow-up periods was lower in the intervention group compared to the control group, overall completion of follow-up surveys with e-mail alone was moderately high (greater than 69%) at each time point. In our study, follow-up rates with e-mail contact alone were higher than most survey-based studies [10]. The overall higher completion rate in the control group (greater than 93% at each time point) was likely to due to the aggressive follow-up protocol established for the parent study, which included contacting participants several times as needed with follow-up by phone or in-person at a location of their choosing, which included home visits.

Use of e-mail contact for survey completion is significantly less resource intensive from a staffing and logistical perspective than in-person interviews, making it an important option for collecting follow-up survey data. In this study, when participants in the intervention group failed to complete their surveys via e-mail contact, research staff used additional standard follow-up methods from the parent study to capture these follow-up data, which resulted in similarly high completion rates between the two groups. This indicates that e-mail contact could be used as a preliminary follow-up strategy to capture a substantial proportion of participants and that standard follow-up can be used as a second-line approach. This two-pronged approach combining e-mail contact with additional standard follow-up for survey research is a novel approach to maximize limited resources in a strategic fashion.

The participant responses to the acceptance and satisfaction questions indicate that contact via e-mail was a convenient and acceptable means to conduct follow-up for adolescent women about contraceptive practices. Most participants completed their surveys at home (63.3%), while others reported completing their survey at another location. Given the range of locations identified for completion of the Web-based surveys, it seems that the flexibility and convenience of e-mail appealed to adolescent women enrolled in the study. We were unable to assess whether those who completed the Web-based survey by e-mail were more likely to answer sensitive questions, as the survey did not allow participants to skip

questions easily. Automated prompts built into the survey directed respondents to answer skipped questions or to indicate that they did not want to answer a question. However, it is likely that e-mail could result in high completion of sensitive questions, as most participants reported being alone (63.6%) at the time of survey completion and, of those who were not alone, most (75.0%) were not worried about anyone seeing their answers.

The interpretation of this study may be limited by volunteer bias, as only 32.9% of those who were eligible enrolled in the pilot study. While our requirement for a response to an initial verification e-mail to enroll participants in the pilot study allowed us to ensure participants enrolled would be responsive to e-mail, it further selected a small study sample of adolescent women who were more willing to participate because they likely had better access to e-mail and were more comfortable with technology. Although our sample size was smaller than the calculated required sample size, we were able to show a significant difference in follow-up between the two study groups.

The adolescent women who were eligible for the study tended to be older, were less likely to be a member of a minority and were less likely to live in a low-income neighborhood than those not eligible. This finding is consistent with other studies demonstrating a significant digital divide for minorities and low-income individuals [6]. Furthermore, this study enrolled racially and ethnically diverse adolescent women from public family planning clinics in Northern California. These participants were largely from low-income neighborhoods, were uninsured or on public insurance, and were at high risk for unintended pregnancy as shown by the high rate of contraceptive discontinuation and unintended pregnancy in the parent study [8]. Our findings may not be generalizable to other adolescent women. Thus, e-mail could potentially result in higher rates of follow-up in adolescent women with higher socioeconomic status who have increased resources and access to e-mail. Our findings indicate that a two-pronged approach with e-mail contact followed by traditional follow-up as demonstrated in this nested pilot study is an effective strategy even amongst lower-income and minority adolescent women. As the use of electronic technologies by youth evolves and with potential narrowing of the digital divide, e-mail contact will continue to be an effective means for communicating with adolescents.

Acknowledgments

This study was supported by the National Institute of Child Health and Human Development grants R01 HD045480 and K24 HD057086-02.

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Fig. 1.
Flow of study participation.

Table 1

Characteristics of participants eligible for e-mail substudy

	Control (N=46) N (%)	Intervention (N=46) N (%)	p
Sociodemographics			
Age, mean±SD	20.2±2.6	19.8±2.3	.46
Race or ethnicity			.03
White	4 (8.7)	1 (2.2)	
Latina	12 (26.1)	7 (15.2)	
African–American	14 (30.4)	8 (17.4)	
Asian or Pacific Islander	7 (15.2)	20 (43.5)	
Multiracial or other	9 (19.6)	10 (21.7)	
Low-income neighborhood ^a	15 (34.1)	17 (37.0)	.83
In school or employed (part-time or full-time)	41 (89.1)	41 (89.1)	1.00
Contraceptive and reproductive history			
Currently has a sex partner	40 (87.0)	41 (91.1)	.74
Previous use of hormonal method	22 (47.8)	24 (52.2)	.68
Previous pregnancy	20 (43.5)	17 (37.0)	.52
Pregnancy desire			
Very upset if became pregnant within 3 months	24 (52.2)	20 (44.4)	.46
Does not want a child in next 2 years or ever	11 (23.9)	14 (31.8)	.40
Very sure will continue contraceptive method for 1 year	23 (50.0)	13 (28.9)	.04
Attitudes toward contraception			
Peers against use of hormonal method	8 (17.4)	2 (4.4)	.09
Main partner against use of hormonal method ^b	6 (13.0)	4 (8.7)	.50
Parents would be upset if they knew she used contraception	12 (26.7)	14 (31.1)	.64

^aDefined as living in a zip code where the percentage of families living below the federal poverty level is greater than the national average.

^bAsked only among those with partners.

Table 2

Participant characteristics among those ineligible for follow-up and those who were eligible and did or did not enroll

Characteristics	Ineligible (N=268) N (%)	Eligible, not enrolled (N=73) N (%)	Eligible, enrolled (N=92) N (%)	p [*]
Sociodemographics				
Age, mean±SD	19.1±2.4	19.1±2.4	20.0±2.4	.03
Race or ethnicity				.01
White	28 (10.5)	12 (16.4)	5 (5.4)	
Latina	75 (28.0)	18 (24.7)	19 (20.7)	
African–American	124 (46.3)	24 (32.9)	22 (23.9)	
Asian or Pacific Islander	13 (4.9)	8 (11.0)	27 (29.4)	
Multiracial or other	28 (10.5)	11 (15.1)	19 (20.7)	
Low-income neighborhood ^a	122 (46.4)	38 (53.5)	32 (32.6)	.02
Contraceptive and reproductive history				
Currently has a sex partner	217 (81.6)	58 (79.5)	81 (89.0)	.09
Previous use of hormonal method	133 (49.8)	40 (54.8)	46 (50.0)	.54
Previous pregnancy	163 (60.8)	36 (49.3)	37 (40.2)	.24
Pregnancy desire				
Very sure will continue contraceptive method for 1 year	94 (35.3)	36 (50.0)	36 (39.6)	.18
Attitudes toward contraception				
Main partner against use of hormonal method ^b	41 (15.3)	11 (15.1)	10 (10.9)	.42
Parents would be upset if they knew she used contraception	44 (16.6)	13 (18.1)	26 (28.9)	.11

^{*}The p value is for the difference between the eligible participants who enrolled and eligible participants who did not enroll.

^aDefined as living in a zip code where the percentage of families living below the federal poverty level is greater than the national average.

^bAsked only among those with partners.