Impact of an Intervention to Improve Contraceptive Use Through Follow-Up Phone Calls to Female Adolescent Clinic Patients

CONTEXT: *Adolescent females often have questions or concerns about their contraceptive methods, and they may discontinue use if these questions are not answered. Little evidence exists on whether follow-up phone calls to address young women's concerns can help sustain contraceptive use.*

METHODS: *Between 2005 and 2007, a total of 805 females aged 14–18 attending a reproductive health clinic in San Francisco were randomly assigned to receive either regular clinic services or regular clinic services plus nine follow-up phone calls over 12 months. The young women were surveyed at baseline and roughly six, 12 and 18 months later to measure condom and contraceptive use, rates of pregnancy and STDs, and other outcomes and mediators. Multiple linear and logistic regression repeated measures analyses were used to assess the program's effects.*

RESULTS: *Clinic counselors completed only 2.7 calls per patient, and made 7.8 attempts for every completed call. Although contraceptive use increased from baseline to follow-up at six months in both groups, levels of condom and contraceptive use, and rates of pregnancy and STDs, did not differ between the intervention and control groups at any of the follow-up assessments. Moreover, the intervention did not improve clinic utilization or satisfaction or have consistent positive effects on participants' attitudes.*

CONCLUSIONS: *Reaching young women by phone after a clinic visit for contraception is challenging and does not appear to provide significant benefits beyond those provided by basic clinic services. More intensive interventions may be needed to markedly change adolescent sexual and contraceptive behavior.*

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Unintended pregnancy, unintended childbearing and STDs are significant problems among teenagers in the United States. Although rates of teenage pregnancy and childbearing declined substantially in the United States between 1991 and 2005, teenage birthrates increased in both 2006 and 2007.[1] Moreover, despite the long decline, the United States still has one of the highest teenage pregnancy rates of any industrialized nation—7% in 2004.[2] An estimated 82% of these pregnancies are unintended.[3] In addition, 38% of sexually experienced 14–19-year-old women have an STD.[4]

Although the decrease in teenage pregnancy rates was primarily due to increased contraceptive use,[5] the most important reason that sexually active young women become pregnant unintentionally is that they fail to use contraceptives consistently and correctly.[6] However, few studies have examined whether family planning clinic-based interventions can improve contraceptive use in this population.

One potentially useful approach for improving contraceptive use is making follow-up phone calls to adolescent females after their clinic appointments for contraceptives. Telephone-administered interventions constitute a potentially cost-effective and confidential way to reach individuals who cannot or may not be willing to return to a clinic on a regular basis.[7–9] When the intervention described in this article was being designed, a growing proportion of the clinic population had begun to use cell phones, making confidential phone calls a viable means of communicating with these women. Such calls might be useful for several reasons: Adolescents may perceive phone calls as confidential, and the calls can be made at times that are more convenient for them than clinic appointments; calls can provide clinic staff the opportunity to conduct repeated brief interventions; and calls can be used to address questions or concerns that young patients have about their contraceptive method or to remind them about follow-up appointments.

One strategy that shows promise as a contraceptive counseling tool—and has been used as a telephone-based brief counseling intervention for HIV prevention—is motivational interviewing.[8–11] This is a directive, client-centered counseling style designed to elicit behavior change by helping clients explore and resolve ambivalence. While motivational interviewing is not based on any theoretical model per se, it is grounded in the health belief model and the transtheoretical model of change. The health belief model posits that individuals' likelihood of engaging in a healthful behavior, such as using condoms or other contraceptives, is influenced by a number of key factors, including their perceptions of the behavior's benefits, the barriers to adopting the behavior, their susceptibility to

an undesirable outcome and the outcome's severity; their self-efficacy (i.e., their confidence in their ability to complete some action successfully); and their exposure to cues to action and to strategies that activate readiness.[12] Motivational interviewing builds on this model and provides a logical way to approach behavior modification. It helps clients identify behaviors that put them at risk for bad outcomes, recognize discrepancies between those behaviors and behaviors that will help them attain desired outcomes, understand the importance of change and recognize their ability to change behavior.[11] In controlled trials, motivational interviewing has been effective for promoting a range of target behaviors and outcomes, including reducing repeat births among teenage mothers.[13–15]

We conducted a randomized, controlled study that rigorously measured the impact of Project Reach, an intervention in which clinic clients received multiple follow-up telephone calls that incorporated motivational interviewing techniques to improve adolescent contraceptive behaviors. We hypothesized that the intervention would increase young women's use of condoms and hormonal contraceptives, and reduce pregnancy rates, by raising their awareness of the risks and consequences of unprotected sex, providing clear information and guidance on condom and contraceptive use, increasing their connectedness to the clinic and access to clinical services, and motivating them to change their behavior.

METHODS

Study Design

Project Reach was implemented in a reproductive health clinic for adolescents and young adults. The clinic, which is affiliated with the University of California, San Francisco, serves a racially diverse, low-income population from surrounding communities, including the Mission District and Bayview-Hunters Point. Each year, more than 2,000 patients make more than 4,500 visits to the clinic.

Female clients visiting the clinic between July 2005 and August 2007 were eligible for study participation if they were aged 14–18, were not pregnant or trying to become pregnant, had had sexual intercourse in the last three months, had not consistently used a hormonal method of contraception for at least three months and did not have an IUD or contraceptive implant. In addition, potential participants had to be willing to be contacted by phone for the 18-month intervention and evaluation period. When young women came to the clinic, clinicians and a full-time research assistant identified those who were potentially eligible for the study. Research staff informed potential participants about the nature of the study and used a screening questionnaire to evaluate their eligibility. They also informed the women that they might receive follow-up phone calls to help them with any problems, questions or concerns they might have regarding birth control, condoms or STDs.

Interested individuals who met the eligibility criteria and consented to participate were enrolled in the study. We did not seek parental consent, because minors can obtain contraceptive services without parental consent in California, and requesting parental consent might have violated participants' right to privacy. Once enrolled, each respondent provided detailed contact information for future calls.

Using a random number generator, we randomly assigned participants to the intervention group or the control group, stratifying them by age. To evaluate the intervention, we collected survey data at enrollment and roughly six, 12 and 18 months later.

To have an 80% chance of finding a 10-percentage-point difference between groups in the proportion of young women who used hormonal methods of contraception for six months or longer, the study needed a sample of about 600 women. Anticipating a follow-up rate of approximately 75%, we strove to enroll about 800.

This study was approved by institutional review boards at ETR Associates and the University of California, San Francisco.

Study Intervention

Prior to the study, clinic staff made follow-up calls to patients only to report abnormal test results or to respond to patients' calls; they did not make follow-up calls for routine visits. The protocol remained in place for study participants assigned to the control group, who received regular clinic services but no regular follow-up calls.

For the Project Reach intervention, trained counselors attempted to make nine follow-up phone calls during the 12 months after each participant's initial visit: one call per month for the first six months, and one call every two months for the next six months. During these calls, counselors asked open-ended questions about the participant's current relationship status, pregnancy desires, and condom and contraceptive use. Counselors incorporated the motivational interviewing principles of listening carefully and nonjudgmentally, summarizing and expressing empathy. The counselors assessed participants' perceptions of risky behaviors and helped them identify the discrepancies between their current risky behavior and their goals (e.g., "What do you think will happen if you continue to use condoms only some of the time?"). They focused on advantages and disadvantages to behavior change identified by the participant (e.g., "What would be good about using condoms all of the time?") and tried to elicit "change talk" (e.g., "I understand that it may be difficult to remember to take a pill every day; what do you think you might do?"). They also inquired about perceived barriers to contraceptive use and answered questions about methods in an effort to enhance the young women's confidence in their ability to use condoms or contraceptives. Finally, they reinforced several messages, especially the superiority of hormonal methods over condoms for preventing pregnancy; the need to use condoms consistently to prevent STDs; and the importance of calling or returning to the clinic with any questions, getting tested once a

year for STDs and keeping scheduled clinic appointments. Counselors used a call documentation form that included a list of topics to be covered during calls and was designed to provide consistency across calls.

The counselors who made the follow-up calls were paid clinic staff who had received training on family planning methods, adolescent risk behavior and counseling techniques. For this project, they also received training on the content of the calls and on appropriate conduct. The instruction included three sessions on motivational interviewing taught by trained psychologists; in addition, counselors received a motivational interviewing guide and training materials designed for this intervention. All attended at least one of the training sessions, and some attended all three. Each counselor observed at least four calls by the project coordinator or a trained counselor and then made at least four observed calls before being allowed to conduct intervention calls alone. Seven counselors made calls during the three years of the study; three were present during the entire intervention, and four made calls for 12–18 months.

Initially, counselors were given one week to reach intervention participants for each follow-up call. About 15 months after the project began, the protocol was revised to give them an additional week, to increase the likelihood of reaching participants. Counselors were instructed to make six call attempts during the two-week window. Attempts to reach a participant were halted if all contact numbers were nonviable, if three voice mails from a counselor (anonymous messages preapproved by participants) went unanswered or if a participant twice said that the call came at a bad time. All attempts to contact the participant were noted on the call documentation form.

Occasionally, follow-up calls in progress needed to be discontinued. If a call was interrupted, it was considered complete. Before ending the call, the counselor told the participant that she could call the counselor back if desired, but that otherwise she would not hear from the counselor until their next scheduled call. Counselors also assessed whether participants had too many distractions to complete the call (e.g., they were riding in a bus). If the counselor determined at the beginning of the call that distractions would be a problem, she attempted to plan a mutually convenient time to call the participant back.

Data

Survey data were collected at baseline (immediately before random assignment) and roughly six months (range, 4–9), 12 months (10–15) and 18 months (16–21) later. At baseline, participants used a laptop computer at the clinic to access an online survey, which was available in English and Spanish. Introductory questions demonstrated how to answer survey items, and respondents could listen to a recording of any question through earphones by scrolling over an icon beside the question. The survey was programmed with skip patterns for nonapplicable questions and with checks to ensure that participants did not unintentionally skip questions and that open-ended numerical questions received numerical answers. All participants, regardless of study group, received 10 condoms at enrollment.

Follow-up surveys were administered either in person or by phone. Respondents completed the in-person surveys at a community center for youth located a few blocks away from the clinic site, using a computer that accessed the online survey. The phone surveys were administered in English or Spanish by trained female interviewers who read the questions from the online survey. Before administering the phone surveys, interviewers checked whether it was a convenient time for the respondent and whether she could talk confidentially. Interviewers were blinded to study group assignments until the final follow-up, at which point they had to ask intervention participants a series of questions about the intervention.

At each follow-up, participants received cash or gift cards ranging from $15 to $25 in value (incentives increased from the first follow-up to the third to sustain the response rate).

•***Outcomes.*** We examined a variety of primary, secondary and tertiary outcomes. The primary outcomes were six measures of condom and hormonal contraceptive use, assessed through responses to five questions. Frequency of condom use was determined by asking women, "During the last three months, how often did you and your partner use a condom when you had sex?" Response options were on a five-point scale ranging from 1="never" to 5="every time." Similarly, frequency of hormonal contraceptive use was assessed by asking, "During the last three months, how many months did you use any hormonal method of birth control (e.g., the pill, Depo, the patch, or the vaginal ring)?" Possible responses ranged from "none" to "all three months." We calculated the proportions of respondents who had used a condom at last sex, had used a hormonal contraceptive at last sex and had used either method at last sex from responses to two questions: "During the last time you had sex, did you and your partner use a condom?" and "During the last time you had sex, which of the following methods of birth control did you use?" (A list of contraceptives followed.) Finally, nonuse of contraceptives was measured by asking respondents, "During the last three months, how many times did you have sex without any method of birth control or condoms?" This was a continuous variable.

The secondary outcomes fell into two categories. Some were events we expected to occur infrequently (emergency contraceptive use, STDs, pregnancy, abortion and birth), and hence our analyses were likely to be underpowered to detect differences between study groups. Others were considered less important or less likely to be affected by the intervention (e.g., number of clinic visits, correct use of each contraceptive method, condom breakage). Correct use of each method was included because the follow-up calls had the potential to increase correct use; it was measured using two or three questions (e.g., "How many pills did you miss last month?").

The secondary outcomes included key constructs of the health belief model that may account for variance in condom and contraceptive behavior. To measure cognitive mediating factors, we created multi-item scales for eight constructs: perceptions of staff empathy, of barriers to using hormonal contraceptives, of effectiveness of condoms, of barriers to using condoms, of partner support for condom use and of self-efficacy to avoid unprotected sex; motivation to use hormonal contraceptives correctly; and concern about effects of contracting an STD.

We used Cronbach's alpha to assess interitem reliability of these scales at all four surveys. Five of the scales (perceptions of staff empathy, condom effectiveness, barriers to condom use, partner support for condom use and self-efficacy to avoid unprotected sex) had good to excellent reliability (alphas, 0.72–0.93); the remaining three had marginal to adequate reliability (0.62–0.71).

In addition, we measured 14 mediating constructs with individual items: perceived ability to get to the clinic and to use the clinic; concern about negative side effects of hormonal contraception and about parents' learning of one's contraceptive use; perception of partner concern about contraceptive use; friends' beliefs about the study participant's contraceptive use; expectation of pregnancy if contraceptives are occasionally not used and if they are never used; self-efficacy to obtain hormonal contraceptives and to use them correctly; belief that condoms break often and do not work; concern about getting an STD; and perceived importance of getting an annual STD test and hassle of getting an STD test. All were assessed using four- or five-point scales.

Finally, we included several tertiary outcomes—behaviors that the intervention was not expected to change, but that were measured to confirm that the program did not influence them (e.g., frequency of sexual intercourse, number of sexual partners).

•***Covariates.*** Covariates were demographic characteristics (e.g., age, race, education level, relationship status, language spoken at home and with friends), reproductive health history indicators (e.g., number of pregnancies prior to the study), previous experience with the clinic (e.g., number of visits prior to the study, satisfaction with the care received at the clinic) and survey method (in person or phone).

Analysis

We analyzed the data in two ways. First, we treated time of the survey (number of months since baseline) as a continuous variable and conducted multiple linear and logistic regression repeated measures analyses, using two-level analysis (time within person). Multilevel analyses used in this way account for the correlation within individuals over time. Second, we grouped surveys completed around six, 12 and 18 months, and used analysis of covariance to measure the intervention's impact at each of those time points.

In both types of analysis, treatment group was the main predictor. To maintain the comparability of the two study groups, we counted participants assigned to the intervention as being in that group even if they did not receive any phone calls (intention-to-treat principle).

Analytic models always included the baseline value of the outcome indicator to control for any group differences that may have occurred despite random assignment. We also controlled for covariates through a two-step process: We considered a covariate for inclusion if the intervention and control groups differed for that variable at the $p<.10$ level at any time point and it was associated with the outcome variable at baseline; we included it in the final model if its model coefficient was significant at $p<.05$. The research team was blind to the composition of the study groups until after the analyses of the primary hypotheses had been completed and summarized.

RESULTS

Sample

A total of 805 young women were recruited for the study and completed the baseline survey. Of these women, 87% completed one or more follow-up surveys—78% the six-month survey, 74% the 12-month and 75% the 18-month. These rates did not differ by intervention group.

Baseline measures of the primary outcomes were not related to attrition at any follow-up. However, several demographic characteristics were associated with attrition

TABLE 1. Selected baseline characteristics of women in a randomized, controlled study of Project Reach, by study group, 2005–2007

Characteristic	Intervention (N=402)	Control (N=403)
PERCENTAGE DISTRIBUTIONS		
Age		
14	5.4	7.3
15	15.1	15.0
16	26.5	26.8
17	26.5	25.1
18	26.5	25.7
Race		
Asian	13.7	17.9
Black	20.9	24.3
Latina	45.3	35.2
Multiracial	16.9	19.4
Other	3.2	3.2
Education		
Attending high school	74.6	75.4
Not attending school/did not graduate	5.5	3.0
Completed high school/GED	19.9	21.6
Married/cohabiting		
Yes	6.5	8.0
No	93.5	92.0
Total	100.0	100.0
MEANS		
Language spoken at home*	2.34	2.21
Language spoken with friends*	1.91	1.82

*Score is on a scale from 1 (only English) to 5 (only other language). *Notes:* None of the differences between the intervention and control groups were statistically significant. Percentages may not total 100.0 because of rounding. GED=general equivalency diploma.

TABLE 2. Primary study outcomes among women in a study of Project Reach, by follow-up period, according to study group

Outcome	No. of observations	6 months		12 months		18 months	
		Intervention	Control	Intervention	Control	Intervention	Control
Mean frequency of condom use in past three months*	1,440	3.46	3.51	3.45	3.44	3.44	3.38
Mean frequency of hormonal contraceptive use in past three months*	1,421	2.76	2.85	2.74	2.74	2.72	2.63
% used condom at last sex	1,436	53	60	55	57	58	55
% used hormonal contraceptives at last sex	1,427	44	44	43	43	43	42
% used condom or hormonal contraceptive at last sex	1,427	82	84	80	81	79	78
Mean no. of times did not use contraceptives in past three months	1,378	2.02	1.87	2.15	2.17	2.29	2.47

*Scores are on a five-point scale; the higher the score, the greater the frequency. *Notes:* Differences between intervention and control groups were not statistically significant at any time point. Hormonal contraceptives are the pill, vaginal ring, patch, injectable and IUD.

at 12 and 18 months. Latinas in the intervention group were less likely than those in the control group to complete the surveys, while Asians in the intervention group were more likely than those in the control group to complete the surveys. At 12 and 18 months, attrition was positively associated with speaking a language other than English with one's friends, regardless of study group; at 18 months, the same was true for speaking a language other than English at home.

At baseline, more than three-fourths of participants were aged 16–18 (Table 1). The sample was racially and ethnically diverse. Seventy-five percent of respondents were enrolled in school. Most spoke only English or mostly English, both with their friends and at home. Fifty-six percent enrolled in the study during their first clinic visit; 16% had ever been pregnant (not shown).

Chi-square tests and t tests revealed that the background characteristics of the intervention and control groups were generally similar. However, the racial and ethnic profiles of the two groups were marginally different (p=.06).

Number of Calls Completed

Although counselors had been instructed to make six attempts to complete each scheduled call, they completed only 30% of the nine calls—a mean of 2.7 calls per participant. The number of completed calls per participant ranged from zero to nine, but only 11% of participants received six or more completed calls. For every completed call, the counselors made 7.8 attempts to reach participants. The most common reason that calls were not completed was that three voice-mail messages were left for the participant, but she did not return the calls. In some cases, participants did not receive the calls because their number had changed or their phone service had been discontinued.

Intervention Impact

Although the proportion of young women who reported using a hormonal contraceptive at last sex increased from 11% at baseline to 44% at the six-month follow-up for the study population as a whole (not shown), the intervention did not have an impact on this or any of the other primary outcomes (Table 2). This was true regardless of whether time was treated as a continuous variable and multilevel analysis was used or time was treated as a discrete variable and either regression or logistic regression analyses were run separately for each follow-up assessment (not shown). Furthermore, effect sizes were generally very small and not always in a consistent direction over time.

Similarly, at none of the three time points did the intervention show an effect on use of emergency contraception; on correct use of condoms, birth control pills, the injectable or the patch; or on condom breakage (not shown). Consistent with these findings, the intervention did not have any effect on pregnancy or STD rates. By the end of the intervention, 25% of study participants had become pregnant, 19% had contracted an STD, and 20% had failed to use either a condom or a hormonal contraceptive the last time they had had sex.

To determine whether Project Reach had had a significant impact on members of any racial or ethnic group, we examined outcomes separately for Asian, black, Latina and multiethnic participants. In a total of 24 tests of significance, only one outcome showed a difference between study groups (p=.04). A statistically significant association would be expected to occur by chance with this many tests of significance.

Because the number of completed calls per participant varied from zero to nine, we examined the relationship between "dosage" (number of calls completed) and each primary outcome. The number of calls completed was significantly related to only one outcome, and the finding was not in the hypothesized direction—frequency of condom use in the previous three months was inversely associated with the number of completed calls (p=.01). In contrast, the reverse appeared to be true for hormonal contraceptive use in the previous three months, but this result was not significant (p=.27).

At none of the three time points did Project Reach have a significant impact on number of clinics visits, perceptions of staff empathy, ease of getting to the clinic, ease of getting help at the clinic or overall satisfaction with the clinic.

Project Reach had impacts on a few potential mediators, but the effects were not in consistent directions. Compared

with patients in the control group, those who took part in Project Reach were less concerned about adverse effects of contraceptives at all three time periods and rated the effectiveness of condoms more highly at six months. They also had lower scores at six months on the measure of self-efficacy to obtain hormonal contraceptives and at six and 12 months on the measure of perceived effects of contracting an STD.

Satisfaction with the Intervention

At the end of the 18-month survey, intervention participants were asked a number of questions about the program's follow-up calls. Although 89% of participants completing the 18-month survey received one or more calls, only 35% remembered receiving any. However, these individuals consistently had positive views of the calls. For example, 82% reported that they had felt completely comfortable talking to counselors over the phone, 68% had been completely unconcerned about others' overhearing them, 94% thought the calls had been somewhat or very helpful, 93% were somewhat or very satisfied with the calls, 85% thought the number of calls was about right, 91% would have liked to continue receiving the calls and 99% would recommend the calls to other adolescents. Similarly, the vast majority of respondents said the calls answered their questions about birth control (92%) and helped them use birth control correctly (80%), use condoms more often (77%), remember to get an STD test (89%) and return to the clinic on schedule (85%).

It may not be feasible to utilize phone communication to deliver this type of behavior change intervention.

DISCUSSION

Our evaluation of Project Reach revealed no impact on the targeted outcomes. The project did not influence contraceptive behavior, clinic attendance, satisfaction with the clinic, or rates of pregnancy and STDs. The few significant relationships we identified between participation and young women's attitudes were not in a consistent direction and may have occurred by chance.

This study did not measure the effects of young women's coming to the clinic; rather, it assessed the impact of the addition of an outreach program designed to contact these young women by phone after they came to the clinic. The data clearly demonstrate that during follow-up, young women in both the intervention and the control groups markedly increased their use of contraceptives and markedly reduced their frequency of unprotected sex. For example, the proportion of young women who reported using a hormonal contraceptive at last sex increased from 11% at baseline to 44% at the six-month follow-up. However, the improvements were roughly equal in the intervention and control groups.

One possible reason that the intervention was ineffective is that clinic attendance itself led to a high degree of behavior change, resulting in a ceiling effect—i.e., clinic patients were so unlikely to engage in unprotected sex, become pregnant or contract an STD that no further improvements were possible when young women took part in Project Reach. The outcome data, however, suggest otherwise: Twenty percent of participants failed to use either a condom or hormonal contraceptives the last time they had sex, a rate comparable with data from the National Survey of Family Growth.[16] Furthermore, 25% of participants became pregnant during the 18-month follow-up period, and 19% contracted an STD, indicating room for improvement.

A more likely reason that Project Reach was ineffective is that counselors were unable to contact participants by phone. Counselors completed only 2.7 calls per participant (instead of the nine calls specified in the protocol), despite considerable effort and multiple attempts to reach them (7.8 per completed call). The study participants were high-risk young women who, in many instances, were not available, did not wish to receive calls, had moved or had had their phones disconnected. While the research team was able to reach and complete interviews with 75% of women in both the intervention and the control groups over a period of about 18 months, the clinic counselors were not. They had other responsibilities and less time, and unlike the research staff, they did not offer participants financial incentives to complete the calls. The intervention was designed to be replicable in a clinical care setting. Although youth are increasingly accessible through cell phones, it may not be feasible to utilize phone communication to deliver this type of behavior change intervention.

Increasingly, young people rely on texting and social networking to communicate with others. While it may be challenging or even impossible to incorporate principles of motivational interviewing into a series of text messages, clinics may be able to use such messages to provide visit reminders and to inquire whether patients who have initiated a new method of contraception have any questions, side effects or other concerns, and whether they are still using their method properly. Patients may be more likely to respond to these messages than to phone calls, and sending these messages may require less time on the part of the counselor than making phone calls.

Another possible reason for Project Reach's lack of efficacy is that the motivational interviewing principles on which the intervention was based may not have been well implemented. Although the counselors had been trained to provide birth control education and risk reduction counseling to clinic clients, the training they received on motivational interviewing for the phone calls was limited. In addition, because a motivational interviewing approach should be client-centered and tailored to client responses, we did not create a strict implementation guide. Instead, we attempted to standardize the training by having the project leader supervise counselors' initial calls and to standardize the calls with the documentation log. However, ensuring incorporation of consistent motivational interviewing strategies in all calls was not possible. A phone intervention incorporating motivational interviewing might be more successful if implemented by professionals with a higher level of formal training in the

approach. Moreover, motivational interviewing is most commonly used in longer, face-to-face sessions, and may not be well suited for comparatively short phone calls.[17] A longer intervention that focuses exclusively on each participant's chosen contraceptive method and on the factors that may affect its use might be more effective.

Project Reach's lack of effectiveness may have been due in part to self-selection bias, because only young women able and willing to receive phone calls participated in the study. Such self-selection might also limit the generalizability of the study. However, information from screening records indicates that fewer than 10% of potentially eligible women declined to participate because they could not be reached by phone or did not wish to be reached. Thus, it is unlikely that self-selection bias affected the results.

A final possible explanation for lack of effectiveness is that nothing prevented members of the control group from discussing their questions and concerns with clinic staff after their visits. However, the clinic has limited resources for responding to follow-up calls, and staff efforts focused on calling clients about abnormal test results, medication requests and prescription refills.

Limitations

This study relied on self-reports of sexual behavior, and these reports may not have always been accurate. However, all participants had come to the clinic and openly discussed their sexual and contraceptive behavior with clinic staff. Moreover, they knew that Project Reach was a clinic program. Thus, it does not seem likely that they would have systematically misreported their behavior in a manner that would have affected the study results.

Furthermore, this study examined the effects of a single project implemented by one clinic. Other clinics might be able to complete a greater number of follow-up calls with a population that is less mobile, more available or more likely to maintain their cell phone numbers. However, the population in this study was somewhat typical of high-risk urban populations that need to be reached.

Conclusion

Contacting young women by phone to address their concerns about their birth control methods or to deliver a very modest intervention is time-consuming and challenging. In-person interventions or perhaps phone-based interventions with fewer phone contacts may be more feasible. Changing adolescent sexual and contraceptive behavior is difficult, and this was a very modest intervention. Given the many contextual and developmental factors that affect young women's lives (e.g., neighborhood unemployment, high rates of pregnancy and STDs, single-parent families), more intensive interventions may be needed to markedly improve their sexual and contraceptive behavior. More experimental research is needed to identify practical and effective interventions to enhance the positive effects of access to clinical services on contraceptive and condom use among adolescents.

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