

Examining long-term effects of *Cuídate*—a sexual risk reduction program in Mexican youth

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ABSTRACT

Objectives. To examine the effectiveness of a safer sex program (*Cuídate*) on sexual behavior, use of condoms, and use of other contraceptives among Mexican youth 48 months after the intervention.

Methods. A total of 708 or 85% of those who participated in the original randomized control study ($n = 829$) were assessed in the 48-month follow-up. Each participant completed a questionnaire on sexual behavior.

Results. Findings indicated that adolescents who participated in the *Cuídate* program were more likely to be older at first sex (odds ratio [OR], 1.27; 95% confidence interval [CI], 0.41–2.12; $P < 0.05$) and to use condoms at first sex (OR, 1.75; 95% CI, 1.14–2.69; $P < 0.05$) or some other type of contraception at first sex (OR, 1.53; 95% CI, 1.00–2.33; $P < 0.05$) than those in the control group. Effects of the intervention on consistent condom use, condom use at last sex, and number of sexual partners were not significant. Gender did not moderate any intervention effects. Social desirability moderated the effect of the intervention on age at first sex.

Conclusions. Results demonstrate the efficacy of *Cuídate* among Mexican adolescents. Future research, policy, and practice efforts should be directed at sustaining safe sex practices across adolescents' developmental and relationship trajectory.

Key words

Adolescent behavior; sexual behavior; adolescent health; risk reduction behavior; follow-up studies; intervention studies; randomized controlled trial; Mexico.

Adolescence marks a time of rapid physical and social development. While the age-span defining it varies across the

globe, it is generally associated with those between 10 and 19 years of age. In Mexico, similar to other parts of the world, adolescents are a group at high risk for unintended pregnancies as well as sexually transmitted infections (STIs), including HIV. For example, national data show that 16.5% to 18% of births between 1990 and 2007 were to adolescent mothers (1) and, as of 2009, 46% of persons with HIV/AIDS were reported as being between 15 and 29 years old, indicating early and unprotected sexual behavior (2). Despite the fact that Mexican adolescents have easy access to contraceptives

(which are cost-free and do not require parental permission), only 40% of adolescents reported using contraception.

Various studies have shown that Mexican adolescents have good knowledge about contraceptive methods. For example, in one study (3), 90.8% of adolescents said they knew at least one contraceptive method and 87.7% said condoms were effective in preventing STIs. However, despite this high level of knowledge, only 27% of girls said they used a condom the first time they had sex, and 65.7% of those who reported that they had sex also reported being pregnant.

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Early and unprotected sex increases adolescents' current and future health risks and decreases their social and educational opportunities. Therefore, developing and testing evidence-based interventions that can be used to reduce sexual risk behavior among adolescents is a national priority.

Sexual risk reduction interventions

Despite the fact that adolescents are at risk for the consequences of early and unprotected sex, few evidence-based interventions have been developed that specifically target this population. A World Bank evaluation of more than 200 youth-oriented HIV interventions worldwide reported that fewer than 2% have been rigorously evaluated (4).

Similar to the global situation, few effective youth-oriented sexual risk reduction interventions have been developed or tested in Mexico. A recent electronic review of studies found only two quasi-experimental prevention interventions conducted among Mexican adolescents (5, 6). In the first study (5), participants were recruited from four *preparatorias* (high schools) in Tijuana, Mexico, and included 320 students (63% girls), with a mean age of 17.6 years (standard deviation (SD) = 1.5). The intervention consisted of a three-hour HIV prevention workshop conducted at all four schools that included pre-intervention and three-month follow-up face-to-face interviews. In addition, a condom distribution program and six-month follow-up were conducted at two schools. At the three-month follow-up, students who participated in the workshop, compared with students in the control group, were significantly less likely to have initiated sexual activity (hazard ratio, 0.21; $P < 0.001$) and more likely to have acquired condoms (odds ratio (OR), 15.68; $P < 0.001$). Workshop participants also reported less traditional views than those in the control group on 1) whether they or their partner should provide condoms and 2) who should suggest that condoms be used ($P < 0.05$). Results of the six-month follow-up indicated the workshop had a moderating effect on sexual initiation. However, the increase in condom acquisition and decrease in cognitive barriers for condom use among intervention participants were not sustained after six months.

The second study among Mexican youth, conducted by Pick and Givaudan

(6), involved the development and testing of an intervention for 9–13 year olds. The program, known as “*Yo Quiero, Yo Puedo*” (“I want to, I can”), is a life skills education program for students in Mexico's *primarias* and *secundarias* (elementary and middle schools). This 15-session, 30-hour, school-based program is designed to strengthen protective factors during childhood to decrease risky sexual behavior during adolescence. Results of the intervention were promising. Sexually active students in the intervention group were significantly more likely than those in the control group to indicate that in the next two months they would engage in sex less frequently and would use condoms. However, no significant effects of the intervention were reported in relation to sexual or condom use behavior at the two-year follow-up.

Similar to sexual risk reduction intervention studies, randomized controlled intervention studies among Mexican or any Latino adolescents are limited in number. A recent meta-analysis of behavioral interventions conducted with Latinos living in the United States (7) found that only three studies (8–10) targeted youth. All three studies developed interventions specifically targeting Latino youth and included follow-ups ranging from 12 to 18 months. The study by Sellers et al. (a community AIDS intervention with a condom distribution component) found that, compared to the control group, males in the intervention group were less likely to initiate first sexual activity and females in the intervention group were less likely to have multiple partners (9). However, no effect was found on onset of sexual activity for females, chances of multiple partners for males, or frequency of sex for either males or females. The study by Koniak-Griffin et al. (a behavioral intervention conducted among pregnant adolescent Latina mothers) found that, compared to the control group, those in the intervention showed statistically significant improvements in AIDS knowledge and intentions to use condoms, and had fewer sex partners, at six-month follow-up (8). These effects were not seen at 12-month follow-up.

In 2006, Villarruel et al. (10) reported changes in sexual behavior and condom use behavior in a randomized controlled trial testing the efficacy of a program known as “*¡Cuidate! Promueve tu Salud*” (“Take Care of Yourself! Promote Your Health”), a sexual risk reduction

intervention adapted for Latinos. The study was conducted with English- and Spanish-speaking Latino adolescents, the majority of whom were of Puerto Rican descent. Adolescents were recruited from schools and community organizations and, after a baseline assessment, randomly assigned to either the six-hour *Cuidate* safer sex intervention or a six-hour health promotion (control) group. The *Cuidate* intervention—which is based on three behavioral theories (social cognitive theory (11–13), theory of reasoned action (14, 15), and theory of planned behavior (16)), and presents abstinence and condom use as culturally appropriate behaviors for both males and females—was delivered by trained facilitators in a small group format. During the 12-month follow-up period, adolescents who participated in the *Cuidate* intervention were significantly less likely ($P < 0.05$) than those in the control group to report having 1) sexual intercourse (OR, 0.66; 95% CI, 0.46–0.96); 2) multiple partners (OR, 0.53; 95% CI, 0.31–0.90); and 3) days of unprotected intercourse (relative risk, 0.47; 95% CI, 0.26–0.84), and significantly more likely to report consistent use of condoms (OR, 1.91; 95% CI, 1.24–2.93).

A randomized controlled trial published in 2008 (17) examined the efficacy of the *Cuidate* curriculum (18) among Mexican youth ($n = 829$) in Monterrey, Nuevo León. A parent component focused on parent–adolescent general and sex communication was added to examine if the intervention would increase communication and whether changes in communication would have any effect on sexual behavior among Mexican youth. Adolescents between the ages of 13 and 17 years and one of their parents were recruited from four *preparatorias* affiliated with the Universidad Autónoma de Nuevo León (UANL). After baseline assessments, families were randomized to either the *Cuidate* safer sex intervention or a health promotion (control) group. A six-hour curriculum was administered among all participating parents and adolescents in small groups of either all parents or all adolescents.

Adolescents randomly assigned to the *Cuidate* intervention received a slightly modified version of the program tested among Latinos in the United States (10, 18, 19). Along with the above-mentioned parent component, modifications

included the use of Mexican music to emphasize program messages, the adaptation of role-plays used in the original curriculum (18) to reflect a Mexican context, and the inclusion of information about pregnancy and contraceptive use. Parents assigned to the *Cuidate* intervention group participated in the parent-adolescent communication component. Both parents and adolescents assigned to the control group received guidance on healthy behaviors such as eating a healthy diet and getting sufficient exercise and sleep, as well as information to deter smoking, alcohol, and drug use. All group sessions were conducted on two consecutive Saturdays at the *preparatorias*.

Follow-up assessments were conducted with all participants at three-, six-, and 12-month intervals. The mean age of the adolescent participants was 15.2 years (SD = 0.66), and less than 10% reported ever engaging in sexual intercourse at baseline. There were no significant differences between the *Cuidate* group and the control group in baseline key demographic characteristics, sexual behavior, or attrition rates.

Results of generalized estimating equations (GEE) analysis indicated no differences in *Cuidate* participants' intention to have sexual intercourse in the next three months throughout the three-, six-, and 12-month follow-ups. However, *Cuidate* participants reported a higher intention to use condoms (mean difference, 0.15; 95% CI, 0.09–0.20; $P < 0.0001$) or other contraceptives (mean difference, 0.16; 95% CI, 0.07–0.24; $P < 0.0001$) in the next three months versus those in the control group. These results were sustained throughout the 12-month follow-up period.

The low percentage of youth who reported ever having sex in the baseline study (< 10%) precluded an assessment of *Cuidate*'s impact on sexual behavior at the time of the initial intervention. The current study—a follow-up assessment conducted 48 months from baseline assessment—was conducted to examine the long-term effect on sexual behavior and the use of condoms or other contraceptives.

MATERIALS AND METHODS

Procedure

The follow-up assessment was approved by the Human Subjects Commit-

tees of the University of Michigan and the UANL. All adolescents who participated in the initial *Cuidate* intervention ($n = 829$) were invited to participate in the 48-month follow-up. Initial efforts to contact the *Cuidate* participants were made by telephone (a maximum of three attempts) to determine their interest in participating in the assessment. A total of 768 adolescents agreed by phone to participate in the follow-up. Once the follow-up assessments were scheduled (three weeks prior to the follow-up), adolescents received information about the date, time, and location by mail. Participants also received a phone-call reminder the day before the follow-up session. The follow-up sessions were held at UANL and the *preparatorias* where the initial *Cuidate* intervention was conducted. A total of 708 adolescents completed the 48-month follow-up assessment.

To participate in the 48-month follow-up, signed adolescent consent was required. Upon their arrival at the follow-up session, adolescents were given the study's consent form and list of procedures, which were similar to those for the previous (three-, six-, and 12-month) follow-ups (17). Project assistants provided a brief overview of the time commitment, expectations, procedures, and confidentiality clause of the study as well as participants' right to discontinue it at any time. After signing the consent form, the adolescents completed a paper-pencil questionnaire administered by the project assistants. Adolescents were given US\$ 10 for completing the questionnaire, which required an average of 45 minutes.

Measures

Various self-report measures were used to assess sexual and condom use behavior among the follow-up assessment participants. These measures were the same as those used in the original study (17) at baseline and in the three-, six-, and 12-month follow-ups. Participants were asked if they had ever had sexual intercourse ("your penis in a girl's vagina" or "a boy's penis in your vagina") and, if so, their age when first sex occurred. Separate questions assessed whether they had used a condom or other contraceptive method (e.g., birth control pills) the first time they had intercourse. Given the past three months

as a reference point, adolescents were asked to indicate on a 5-point Likert scale how often they used a condom (1 = "never" to 5 = "always") and how often they used some other type of contraceptive. They were also asked to indicate the number of sexual partners they had had in the last three months. For any questions about sexual behavior and use of condoms or other types of contraceptives in past three months, adolescents were asked whether they had ever had sex and whether they had had sex in the last three months. Binary variables were created for consistent condom use ("always used a condom," 0 = "no" and 1 = "yes"; and "number of sexual partners," 0 = "1 or no partner" and 1 = "2 or more partners").

Consistent with the previous studies (10, 17), the 13-item short version of the Marlowe-Crowne Social Desirability Scale (20), known as the MC-C, was used to examine the influence of social desirability (the tendency to provide favorable answers to gain the approval of others), which can bias self-report measures and render the validity of the data questionable. Measures of social desirability have been used widely in previous research (21) to assess response bias. The scale items include statements that describe socially and culturally appropriate attributes (personal behaviors and attitudes) (e.g., "I'm always willing to admit it when I make a mistake") and socially and culturally inappropriate attributes (e.g., "I sometimes try to get even, rather than forgive and forget") and are deemed "true" or "false" by survey participants. The former type of statements are most likely false but are often deemed "true" due to their social desirability, whereas the latter type of statements are most likely true but are often deemed "false" due to their lack of social desirability. The first type of effect is known as the "attributes factor" and the second type of effect is known as the "denial factor." The mean score for adolescent *Cuidate* participants on the MC-C was 0.58 (SD = 0.20). Total scale scores, which were the mean of all 13 items, ranged from "0" to "1," with higher scores reflecting lower [self-reported] social desirability. The measure of internal consistency for the scale was acceptable (Cronbach's alpha = 0.68) and within the range reported in other studies (0.62 to 0.76) (20) and in baseline scores in the original study (17).

Sample size and statistical analyses

Power analysis was conducted using the methods and effect size definitions of Cohen (22). Results indicated a power of 91% to detect a medium to small effect ($d = 0.25$) of the intervention on continuous measures (e.g., “age at first sex”) at the 48-month follow-up, with a two-tailed alpha of 0.05. Results of power analysis for dichotomous measures (e.g., “condom use at first sex”) indicated a power of 92% to explain a medium-sized effect (i.e., an OR of 2.0) while controlling for other covariates with a medium-sized, squared, multiple correlation (coefficient of determination (R -squared) = 0.13) with the predictor. There was a power of 83% to detect an OR of 1.75 for any dichotomous outcome (e.g., “ever had sex,” “use of condom at first sex,” and “use of other contraceptive at first sex”).

To test the long-term efficacy of the *Cuidate* intervention in reducing sexual risk behaviors, only data at a single time point (48 months) were used. This approach was applied because 1) there were no statistically significant differences in sexual behavior, condom use, or other contraceptive use between the intervention group and the control group at any time point (i.e., during pretest measures or at three-, six-, and 12-month follow-up) (20), and 2) there were no significant correlations between pretest measures and sexual behavior, use of condoms, or use of other contraceptives at 48-month follow-up (i.e., all P -values were > 0.05).

To determine the effects of the intervention on age at first sex, use of condoms at first sex, and use of other contraceptives at first sex, the entire 48-month sample was used. To determine the effects of the intervention on consistent condom use, frequency of condom use, frequency of other contraceptive use, and number of partners, participants who indicated that they were married ($n = 45$) were excluded.

To identify unadjusted significant differences between the intervention group and the control group on demographic variables and measures of sexual behaviors, a series of independent-sample Student's t -tests and chi-square analyses were conducted. Hypotheses regarding the main effects of the *Cuidate* intervention on sexual behaviors and condom use outcomes were tested in generalized

linear model (GLM) analyses. Hierarchical generalized linear regression analyses were performed to determine whether the intervention's effect on the primary sexual behavior outcomes differed as a function of predictors the authors had identified a priori (gender and social desirability). Pretest demographic variables and sexual outcome variables were not included as covariates in these analyses because there were no significant differences between the intervention group and the control group on key demographic variables or sexual outcomes in prior analyses of pretest data. In addition, only a small number of participants reported sexual behavior at pretest. Analyses were conducted using an intention-to-treat approach in which participants were analyzed in their original randomized groups.

RESULTS

Participants

A total of 708 adolescents or 85% of those who participated in the original study ($n = 829$) completed the 48-month follow-up: 394 adolescents (86.8%) in the *Cuidate* group and 314 adolescents (83.7%) in the control group. There were more female than male participants (405

or 57% versus 303 or 43% respectively). The mean age of all participants at the 48-month follow-up was 19.22 years ($SD = 0.73$), and 6% ($n = 45$) reported that they were married. Analysis of the follow-up data using the Student's t -test and chi-square test revealed no significant differences in demographic characteristics or attrition rates between the two groups.

Effects of the intervention on sexual behaviors

At the 48-month follow-up, 60% of the study participants ($n = 423$) reported that they had had sexual intercourse. The mean age at first sex was 17.15 years ($SD = 1.54$). Of the 334 adolescents who reported that they had had sex in the past three months, 81% ($n = 285$) said they had used a condom, but only 42% ($n = 146$) reported consistent use of a condom during the same period. Those who reported using condoms in the past three months said they did so an average of 2.26 times ($SD = 4.87$), whereas their use of some other type of contraceptive reportedly occurred an average of 2.98 times ($SD = 8.05$). Only 15% ($n = 49$) of the participants reported having more than one sexual partner in the past three months.

As shown in Table 1, chi-square analyses measuring the unadjusted effects of

TABLE 1. Self-reported sexual behavior among 708 adolescents by study group (intervention and control) at 48-month follow-up, Monterrey, Mexico, 2007–2008

Variable	Health promotion (control) group ($n = 314$)		<i>Cuidate</i> safer sex intervention group ($n = 394$)		P^a
	No.	%	No.	%	
Ever had sex					
Yes	180	57.32	243 ^b	61.68	0.24
No	134	42.68	151	38.32	
Condom use at first sex ^c					0.01
Yes	116	64.44	187	76.33	
No	64	35.56	58	23.67	
Use of other contraceptive at first sex ^c					0.04
Yes	117	65.00	182	74.29	
No	63	35.00	63	25.71	
Consistent condom use in past 3 months ^{c,d}					0.43
Yes	58	39.19	88	43.35	
No	90	60.81	115	56.65	
> 1 sexual partners in past 3 months ^{c,d}					0.89
Yes	21	15.11	28	14.58	
No	118	84.89	164	85.42	

^a Based on chi-square analysis.

^b Number of sexually active adolescents is lower than that for related variables due to missing data.

^c Numbers exclude those who reported that they had never had sex.

^d Numbers exclude those who reported that they had not had sex in last three months.

the *Cuidate* intervention on sexual behavior and condom or other contraceptive use indicated significantly higher use of condoms or other contraceptives at first sex compared to the control group (76% versus 64% and 74% versus 65% respectively; $P < 0.05$). There were no significant unadjusted differences between the two groups for the other variables presented in Table 1 ($P > 0.05$). Table 2 shows mean frequency of use of condoms or other contraceptives in the last three months, as well as mean social desirability.

Results of GLM analyses, controlling for gender and social desirability, revealed significant effects ($P < 0.05$) of the *Cuidate* intervention on use of condoms at first sex, use of other contraceptives at first sex, and age at first sex. As seen in Table 3, adolescents in the *Cuidate* group were older at first sex (regression coefficient [B], 1.27; 95% CI, 0.41–2.12) and more likely to use condoms at first sex (OR, 1.75; 95% CI, 1.14–2.69) or other contraceptives at first sex (OR, 1.53; 95% CI, 1.00–2.33) than those in the control group.

The *Cuidate* intervention had no significant effect on consistent condom use (OR, 0.86; 95% CI, 0.56–1.33); frequency of condom use (B, 0.67; 95% CI, –0.08–1.41); frequency of other contraceptive use (B, 1.08; 95% CI, –0.15–2.32); or having more than one sexual partner (OR, 0.94; 95% CI, 0.69–1.27).

Moderation effects

The authors also examined whether gender and social desirability moderated

the effects of the intervention. Gender did not moderate the effects of the intervention on age at first sex or condom or other contraceptive use at first sex (i.e., the intervention was equally as effective among males and females).

Similarly, social desirability did not moderate the intervention's effect on the use of condoms or other contraceptives at first intercourse. However, social desirability did predict the intervention's effect on age at first sex. Further analyses indicated that adolescents who participated in the *Cuidate* intervention and reported low to moderate levels of social desirability (less than 0.71) also reported being older at first sex than those who reported similar levels of social desirability in the control group ($P < 0.01$).

DISCUSSION

Findings extend evidence for the efficacy of the *Cuidate* intervention for use with Mexican adolescents. Results indicate that the intervention significantly affected age at first sex, condom use at first sex, and other contraceptive use at first sex. Adolescents who participated in the *Cuidate* program were likely to be older at age of first sex and more likely to use a condom or other type of contraceptive method at first sex. It is important to note that the lower range of 95% CI on the OR for the use of other contraceptive at first sex was 1.00. This was consistent with the statistical significance of the test. While the OR of 1.53 represents a relatively weak relationship, with the odds a little more than 50% higher in one

group than the other, the finding is of practical significance.

According to the results of the current study, these significant effects on sexual behavior and the use of condoms or other contraceptives at first intercourse were not sustained 48 months after the intervention. However, this lack of sustainability may reflect various study limitations rather than any deficits in the *Cuidate* curriculum. For example, the short duration of the initial trial—a one-time, six-hour intervention—may have constrained the potential long-term effects. On the other hand, the 48-month follow-up period may have been too long. Few studies have assessed the impact of interventions beyond 12 months. In addition, the effects of the *Cuidate* curriculum at 48-month follow-up may have been underestimated as a result of cross talk between the two study groups, which were in close proximity during the follow-up sessions. Information exchange could have exposed control group participants to information from the *Cuidate* program, resulting in their adoption of safer sexual behaviors promoted in the *Cuidate* curriculum and thus skewing the effect of the intervention.

Regardless of the effect of these potential constraints, current findings suggest the need for continued focus on developing adolescent skills and attitudes to promote safer sex behavior. As adolescents develop and mature, changes in their relationship status and concerns about marriage, pregnancy, and career may have a strong influence on their sexual behavior. Adolescents must be provided with opportunities to develop and enhance sexual decision-making refusal and partner negotiation skills and the ability to adapt and apply them to different situations. A common criticism of behavioral interventions similar to *Cuidate* (23) is that they only have short-term effects because they do not address the larger social and environmental forces that shape and reinforce individual behavior. Sexual risk behaviors, like other risk behaviors, are the product of participation in a specific social context. Therefore, an understanding of how different social contexts affect attitudes and behaviors is needed to develop effective sexual risk reduction interventions (24, 25). Findings from this study also point to the need to explore the impact of structural influences (e.g., social inequalities) on sexual behavior.

TABLE 2. Self-reported age at first sex, social desirability, and frequency of use of condoms or other contraceptives in the last three months among 708 adolescents by study group (intervention and control) at 48-month follow-up, Monterrey, Mexico, 2007–2008

Variable	Health promotion (control) group (n = 314)	<i>Cuidate</i> safer sex intervention group (n = 394)	P^a
	Mean (standard deviation)		
Age at first sex ^b	16.99 (1.69)	17.26 (1.41)	0.07
Frequency of condom use in past 3 months ^{b,c,d}	1.89 (4.05)	2.55 (5.41)	0.08
Frequency of use of other contraceptives in past 3 months ^{b,c,d}	2.37 (5.94)	3.45 (9.36)	0.09
Social desirability ^c	0.58 (0.20)	0.59 (0.20)	0.50

^a Based on independent-sample Student's *t*-test.

^b Excluding those who reported that they had never had sex.

^c Sample size (number of sexually active adolescents) varies due to missing data.

^d Excluding those who reported that they had not had sex in last three months.

TABLE 3. Effects of *Cuidate* safer sex intervention on first-sex age and use of condom or other contraceptive^a at 48-month follow-up, adjusted for gender and social desirability, Monterrey, Mexico, 2007–2008

Predictor variable	Age at first sex (<i>n</i> = 421 ^b) ^c		Use of contraceptive at first sex (<i>n</i> = 425) ^d			
	Regression coefficient (B)	95% CI ^e	Condom		Other	
			OR ^f	95% CI	OR	95% CI
<i>Cuidate</i> intervention ^g	1.27 ^h	(0.41, 2.12)	1.75 ^h	(1.14, 2.69)	1.53 ^h	(1.00, 2.33)
Female ⁱ	0.70 ^h	(0.42, 0.98)	1.38	(0.90, 2.11)	1.57 ^h	(1.03, 2.40)
Social desirability	1.96 ^h	(0.90, 3.03)	3.18 ^h	(1.11, 9.07)	2.42	(0.86, 6.83)
<i>Cuidate</i> intervention social desirability	−1.79 ^h	(−3.20, −0.39)		NA ^j		NA

^aAll nonsignificant interactions were deleted from the modeling.

^bSample size (number of sexually active adolescents) differs from that of other variables due to missing data.

^cAnalyzed through linear regression.

^dAnalyzed through logistic regression.

^eCI = confidence interval.

^fOR = odds ratio.

^gReference group = health promotion control group.

^h*P* < 0.05.

ⁱReference group = male.

^jNA = not applicable.

Other important findings from this study were that 1) the effects of the intervention were similar for males and females and 2) social desirability did not interact with the effects of the intervention on condom or other contraceptive use at first sex. More difficult to interpret is the finding that social desirability predicted the effects of the intervention in relation to age at first sex. The authors conducted additional correlation analysis to confirm this data; the resulting scores on the social desirability measure were weakly but positively correlated only with age at first sex ($R = 0.128$; $P < 0.05$). This finding suggests that those in the intervention group with low to moderate social desirability reported an older age at first sex than those with similar levels of social desirability in the control group. The authors did not conduct a factor analysis of the scale and could not determine whether study participants' statements reflected the attributes or denial factors, as has been previously reported (10, 17). Nor is it clear whether participants viewed having had sex or being older at first sex as socially desirable responses.

The authors included the measure of social desirability to increase confidence in the self-report measures and to examine whether adolescents were unduly influenced in their responses by the need to be socially accepted. In previous studies with Latino adolescents (10), and in

the original *Cuidate* study (17), there was no interaction with measures of social desirability and self-reported behavioral outcomes. Some researchers (21) suggest that the use of a measure of social desirability scores either has no effect on or dilutes the relation between self-report and objective criteria. In any case, findings warrant further study.

It is important to note several limitations of this study. First, it is not clear from this study at what point adolescents stopped using condoms or other contraceptives, or, more importantly, what factors contributed to this behavior. The large gap between the 12- and 48-month follow-up assessments makes it difficult to determine where changes occurred. Second, there is the possibility of bias in the use of self-report measures. The moderator effect of social desirability on the response related to age at first sex may indicate some bias, but the meaning of this finding is not clear.

Despite these limitations, the study is significant given the few behavioral interventions that have been developed and shown to be efficacious with Latino or Mexican youth. Results of this study have important implications in the design of efficacious interventions for Mexican adolescents and contribute to the science related to the frequency, type, and timing of behavioral interventions needed to prevent STIs, including HIV,

among adolescents. While the results of *Cuidate* in preventing early and unprotected sexual behavior are evident, future efforts should be directed at sustaining safe sex practices across the developmental and relationship trajectory. In addition, the lack of sustainability of individual-focused behavioral interventions underscores the importance of government policies as well as school and community efforts to support safer sexual behavior and, ultimately, reduce the risk of unplanned pregnancies, and STIs, including HIV.

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RESUMEN

Examen de los efectos a largo plazo de *Cuídate*, un programa de reducción del riesgo sexual en jóvenes mexicanos

Objetivos. Examinar la eficacia de un programa de promoción de actividad sexual de menor riesgo (*Cuídate*) en cuanto al comportamiento sexual, el uso de condones y el uso de otros anticonceptivos en jóvenes mexicanos, 48 meses después de la intervención.

Métodos. En el seguimiento después de 48 meses, se evaluó un total de 708 (85%) de los que participaron en el estudio de control aleatorizado original ($n = 829$). Cada participante respondió a un cuestionario sobre su comportamiento sexual.

Resultados. Los resultados indicaron que los adolescentes que participaron en el programa “*Cuídate*” tenían una probabilidad más alta de tener una edad mayor en la primera relación sexual (razón de posibilidades [OR]: 1,27; intervalo de confianza [IC]: de 95%, 0,41–2,12; $p < 0,05$) y de usar condones (OR: 1,75; IC 95%: 1,14–2,69; $P < 0,05$) o algún otro tipo de medida anticonceptiva en la primera relación sexual (OR: 1,53; IC 95%: 1,00–2,33; $P < 0,05$) en comparación con los del grupo de referencia. Los efectos de la intervención sobre el uso constante de condones, el uso de condones en la última relación sexual y el número de compañeros sexuales no fueron considerables. El género no moderó los efectos de la intervención. La conveniencia social moderó el efecto de la intervención sobre la edad en la primera relación sexual.

Conclusiones. Los resultados demuestran la eficacia del programa “*Cuídate*” en los adolescentes mexicanos. En el futuro, la investigación, las políticas y la práctica deberán dirigirse a promover actividades sexuales de menor riesgo en el desarrollo y las relaciones de los adolescentes.

Palabras clave

Conducta del adolescente; conducta sexual; salud del adolescente; conducta de reducción del riesgo; estudios de seguimiento; estudios de intervención; ensayo clínico controlado aleatorio; México.