

Outcomes of a Culturally-Based Sexually Risk Reduction Intervention for Adolescents in Puerto Rico: A Cohort Evaluation Report

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Abstract

Objective: Teen pregnancy and sexually risky behaviors among adolescents represent a major public health concern. Despite reduction of teen birth rates, Hispanic adolescents still report higher rates in comparison to other racial and ethnic groups. Under uncontrolled community and school settings, ¡Cúidate! was implemented for assisting Puerto Rican youth to reduce sexual risk behaviors in high risk communities.

Methods: A prospective assessment was conducted among adolescents that participated in the intervention. A stratified probabilistic sample of 185 adolescents was re-contacted and comparisons were made between participants that completed and not completed the intervention in terms of intent to have sex, sexual encounters, contraceptive methods, teen pregnancy, and improvement in life coping skills.

Results: After intervention's completion participation, adolescents were more likely to ask sexual partner to use any birth control or condom than non-completers. Completers reported 75% less probability of reporting sex ever than those non-completers after controlling for age and gender. They also were more likely to indicate higher intentions to have sex. Among those adolescents that indicated not having sex before starting the intervention, 12.0% had sex and from those that had sex after the intervention, 1.2% reported being pregnant or gotten someone pregnant.

Conclusions: The investigation found that an impact in knowledge and attitudes were experienced. Despite teen pregnancy prevention did not reach statistical significance, it resulted in lower incidence than the general population of adolescents. ¡Cúidate! resulted effective in changing the perception towards abstinence, condom utilization, and in delaying age of first sexual encounter.

Keywords: Adolescents; Risk reduction; Hispanic/Latino; Sexual behaviors; ¡Cúidate!

Introduction

Teen pregnancy and sexually risky behaviors among adolescents represent a major public health concern. Despite reduction of teen birth rates among females aged 15-19 since 2007 to 2015 in the United States, Hispanic adolescents still report higher rates in comparison to other racial and ethnic groups [1]. Moreover, the same pattern was observed for the rates of chlamydia, gonorrhea and syphilis in 2016, in which the rates were higher among Hispanics than for Whites, in both groups, 10-14 and 15-19 years old [2]. Several studies have found that attitudes towards sex and early sexual initiation are associated with later sexual transmitted infections (STIs), disinhibition, impulsiveness, pregnancy, and multiple sex partners [3-5]. These trajectories of risk are hypothesized to influence substance use disorders and sexual risk behaviors later in life [6].

Recent data from the Puerto Rico Department of Health (PRDOH) revealed that the teen birth rate for 2010 and 2015, respectively, was 51.3 and 33.9 per 1,000 teen females aged 15-19 [7]. Despite this decline, Puerto Rico ranked first in the teen birth rates among all US

states and the second among US territories [8]. In addition, the reported overall rate among female adolescents aged 15 to 19 for 2013 was almost twice the US teen birth rate (44.6 births per 1,000 teen females versus 26.5 births per 1,000 teen females) [8].

According to the Sexual Transmitted Disease Surveillance System at the PRDOH, chlamydia continues being the most common STI among adolescents followed by gonorrhea and syphilis [9]. Data extracted from Consulta Juvenil, a Puerto Rican biennial school survey that is conducted for public and private school students aged 12 to 17, indicated that 26.7% of the students reported have ever had sexual intercourse and among these more than half (60.4%) stated that were sexually active before reaching 15 years old [10]. Furthermore, only one out of every five sexually active students indicated have used a birth control method; being the most frequently reported the use of condoms (62.1%), followed by "withdraw before ejaculation" (21.0%), and the use of oral contraceptive pills (7.0%). Specific information regarding sexual behaviors using the 2015 Youth Risk Behavior Surveillance System (YRBSS), found that for Puerto Ricans, 20.2% of females had sexual intercourse and 49.6% of females did not use a condom; while 28.4% of males reported sexual intercourse and 53.7% did not use a condom. Other birth controls such as pills, intrauterine devices (IUD), implant, shot, patch or rings were not used by 93.7% of

females and 92.9% of males [11]. When similar indicators were compared with the United States Hispanic students, the percentages are statistically different [12]. Had sexual intercourse before age of 13 year (2.5% vs. 5.0%); ever had sexual intercourse (23.8% vs. 42.5%); condom use (50.6% vs. 44.4%); did not use any method to prevent pregnancy (37.1% vs. 20.0%) are some examples for Puerto Rican vs. US Latino students, respectively.

Even the overall decrease in the Puerto Rican teen rate in the last decade, efforts are still needed to reduce the number of adolescents sexually active and promote sexual responsible education. These issues may be addressed by offering evidence-based practices (EBPs), which provide an opportunity to deliver pregnancy prevention education services and to influence the adolescents sexual risk behaviors [13,14]. A good example of an EBP tailored for Hispanic/Latino youth is ¡Cuidate! intervention. Previous investigations under controlled settings demonstrated that ¡Cuidate! participants were less likely to report sexual intercourse, multiple partners, and days of unprotected intercourse and more likely to report using condoms consistently [15]. In other research, adolescents assessed at 48-months were more likely to be older at first sex encounter and to use condoms at first sex encounter, or some other type of contraception than those in the control group [16]. While others identified improvement in knowledge, skills and attitudes but no impact in recent sexual activity or recent unprotected sexual activity [17].

However, the implementation of EBPs in real settings requires efforts to assess intended outcomes. The process recommended by developers requires additional tasks and responsibilities, as well as additional resources that sometimes due to limitations and challenges are very difficult to comply within current organizational structures [18,19]. Additionally, service grants usually do not provide mechanisms to support research since the focus is on the provision of

only services. The program entitled Puerto Rico Personal Responsibility Education Program (PR-PREP) of the Maternal, Child, and Adolescent Health Division at the PRDOH under grant HHS-2010-ACF-ACYF-PREP-0125 from the Administration on Children, Youth and Families/Family and Youth Services Bureau, incorporated ¡Cuidate! for supporting Puerto Rican youth to reduce sexual risk behaviors in high risk communities. Taking advantage of the delivery of intervention, we conducted a cohort evaluation to compare sex encounters, intent to have sex, increase condom use and other contraceptive methods, and improve life and coping skills among intervention completers and non-completers.

Methods

Population of study

The PR-PREP has provided services to 2,341 adolescents from 10-16 years old residing in five municipalities (Naguabo, Humacao, Yabucoa, Maunabo, and Vieques) located at the southeast region of Puerto Rico. A total of 440 and 478 participants that completed the Spanish Exit Instrument during Year 1 (Cohort 2014) and Year 2 (Cohort 2015) were considered for follow-up assessment at 36 months and 24 months after intake, respectively. Table 1 shows the distribution by year and municipalities that served as the sampling framework. To determine the possible effect of the intervention among the cohorts, a representative sample was selected by a stratified random selection process that considered year of participation and municipalities. A representative sample of 185 students was obtained and re-contacted for follow-up from February 2017 to June 2017. Follow-up assessment and procedure protocols were approved by the Medical Science Campus, University of Puerto Rico IRB# A4760113.

Municipality	Year 1		Year 2	
	Total Cases (%)	Random Selection (%)	Total Cases (%)	Random Selection (%)
Naguabo	90 (20.5)	16 (17.8)	99 (20.7)	20 (21.1)
Humacao	151 (34.3)	29 (32.2)	176 (36.8)	33 (34.7)
Yabucoa	111 (25.2)	22 (24.4)	119 (24.9)	22 (23.2)
Maunabo	82 (18.6)	22 (24.4)	55 (11.5)	13 (13.7)
Vieques	6 (1.4)	1 (1.1)	29 (6.1)	7 (7.4)
Total	440	90	478	95

Table 1: Sample selection representativeness by year and municipality.

Research demonstrated that real implementation effect is statistically significant but with low effect size for age at first sex encounter, use of condoms at first sex encounter, and other type of contraception [16]. Considering the occurrence of characteristics under investigation within groups, the lowest proportion found was 15%. This proportion and considering the population size of 918 adolescents with Entry and Exit surveys, $\alpha=0.05$, and 10 stratas (5 municipalities per 2 years), indicates that the sample should be around 170 adolescents (Epi Info 7 StatCalc). For controlling for any drop out, an attempt to survey an additional random 10% of the sample was included to ensure the sample size is sufficient to draw a power of 80%.

As result, a sample of 185 re-contacted participants was obtained and later compared with those not re-contacted for key variables gender, age, school level, completed intervention, and report of having sex ever. Results indicated that these variables were not statistically significantly different ($p>0.05$), making the groups comparable and representative.

Intervention

¡Cuidate! or “Take Care of Yourself” is an adaptation of the Be Proud! Be Responsible! program and consist of six 1-hour duration educational sessions that were culturally designed to reduce HIV

sexual risk among Latino youth using an interactive format of learning the information (music, video, short stories, role-plays, group dynamics) [15]. ¡Cuidate! aims to increase each participant’s skill level and self-efficacy in communicating and negotiating with sexual partners about abstinence and condom use; help teens develop the technical skills they need for correct condom use; and provide important information about the causes, diagnosis, transmission and prevention of HIV and STIs. The intervention is listed in the “Teen Pregnancy Prevention Evidence Review” and reviewed for medical accuracy by the Office of Adolescent Health [20,21]. Prior PR-PREP implementation, minor adaptations were made including frequency of the sessions to be flexible with the time and days provided in the implementation sites (1-2 times per week), the size of the groups up to 16 participants, and the length of each session that was reduced from 60 to 50 minutes in order to accommodate class requirements (curriculum’s adjustments made included shorten examples and activities such as no more than 2 role-plays per activity).

Measures and statistical analyses

The outcome monitoring involved tracking changes in attitudes, beliefs, intentions, and behaviors derived from the participation included subgroups of participants that completed the intervention (75% or more, or five out of six planned sessions) and/or reporting sex. This categorization provided clues on significant elements to consider based on the goals and expected outcomes of the program. Domains included as part of this assessment were: (a) change in attitudes towards perception of peer pressure, stress management, conflict resolution, friends influence, respect, aspirations for attaining goals (i.e., academic achievement, continue studies, getting a job), communication with parents and family, making healthy decisions towards not using drugs and alcohol, and money management; (b) questions on intentions of having sex, using contraceptive, using condoms, and abstaining from sex; (c) perceived control over the ability to abstain from sex or to engage in safer sex, tell friends about sexual activity, and tell parents about sexual activity; (d) questions about behaviors in terms of sex in the last year, pregnancies, number of sex partners, and sex safe practices (such as use of contraceptive or birth control methods including condoms); and (e) program satisfaction. Measures used were obtained from the implementer’s package and funder for measuring fidelity and outcomes.

Areas were measured for determining the reliability using the coefficient of internal consistency. The Scale of Life Skills contains 13 questions with a Likert-scale response ranging from “much more likely” to “much less likely”. The analysis presented that for this

population the instrument obtained excellent internal consistency (Cronbach’s alpha=0.944). The Satisfaction Level was measured by a five-item scale ranging from “none of the time” to “all of the time”. The instrument has good internal consistency (Cronbach’s alpha=0.832). In regards to the measures of engagement of sexual activity, sexual abstinence, and use of contraceptive and birth control methods; these were independent questions to establish changes over time. Each of these independent measures used a scale ranging from “much more likely” to “much less likely”.

For this study, an evaluation of repeated measures was conducted. ¡Cuidate! was implemented under uncontrolled real community and school settings in which pre-post design is considered appropriate based on limitations of a control group and resources. Descriptive statistics used to summarize the characteristics of the participants included frequencies and percentages for categorical variables and central tendency and dispersion measures for continuous variables. To account for the distribution of continuous variables, a normality diagnostic test was performed using the Shapiro-Francia estimator. The significance level (α) was set to ≤ 0.05 . Post-hoc power ($1-\beta$) analyses were conducted and reported according to G*Power 3.1.9.2 calculation for two dependent means, matched pairs. Logistic regression was conducted for sex report before the program and at treatment completion controlling for age and gender. Statistical analyses were performed by IBM SPSS Statistics 24.

Results

Approximately 53.5% of the participants were females, age ranged from 13 to 18 years with a mean age of 15.9 ± 0.99 years, and the majority enrolled between 10th and 11th grade (68.0%) at the time of the follow-up interview. Out of the 185 participants interviewed for the cohort evaluation, 175 (94.6%) satisfactorily completed the intervention and 15.7% reported ever have sexual intercourse.

Table 2 illustrates the perception in the improvement of life coping skills due to program participation. Areas of significant improvement in their lives after the intervention were reported for “being respectful”, “making plans”, “doing well in school” and “getting more education”. On the other hand, participants reported a significant decrease in the “managing money” area. A similar comparison but controlling by program completion indicated that “get a steady job” was the only area in which those not completing the program identified improvement, $t(9)=2.86$, $p=0.025$, two tailed; while those completing the intervention indicated improvement only in the area of “getting more education” $t(173)=2.59$, $p=0.010$, two tailed.

Area	n	Mean ^a (SD)	Mean ^a (SD)	p value	d^b	$1-\beta^c$
		Exit Interview	Follow-Up			
Resist or say no to peer pressure	184	1.81 (1.31)	2.00 (1.39)	0.128	0.14	0.6
Know how to manage stress	183	1.89 (1.09)	2.07 (0.99)	0.082	0.17	0.75
Manage conflict without causing more conflict	181	1.76 (1.00)	1.83 (0.99)	0.457	0.07	0.24
Form friendships that keep you out of trouble	183	1.74 (1.20)	1.57 (1.01)	0.121	0.15	0.66
Be respectful toward others	184	1.59 (1.12)	1.41 (0.84)	0.042	0.18	0.78
Make plans to reach your goals	184	1.54 (1.12)	1.33 (0.77)	0.034	0.21	0.89

Care about doing well in school	184	1.40 (1.06)	1.22 (0.61)	0.045	0.2	0.84
Get a steady job after you finish school	182	1.54 (1.12)	1.49 (0.81)	0.568	0.05	0.17
Share ideas or talk about things that really matter with a parent/guardian	184	1.80 (1.13)	1.76 (1.01)	0.668	0.04	0.13
Make healthy decisions about drugs and alcohol	185	1.46 (1.04)	1.42 (0.94)	0.649	0.04	0.13
Get more education after high school	184	1.48 (0.96)	1.28 (0.67)	0.018	0.23	0.94
Manage money carefully, such as making a budget, saving, or investing	183	1.62 (1.11)	1.83 (1.00)	0.048	0.19	0.94
Be the best that you can be	183	1.43 (1.00)	1.44 (0.80)	0.901	0.01	0.07
^a Likert scale; 1="much more likely" to 5="much less likely". ^b Effect size= <i>d</i> the correlation between measures was considered in the calculation (Cohen's method). ^c Power obtained from the post-hoc analysis.						

Table 2: Mean scores obtained for change in attitudes for coping life skills at exit and follow-up interviews.

Regarding the probability of engaging in sexual activity and use of birth control methods after the participation in the program, adolescents were more likely to indicate better scores at follow-up in comparison to exit interview. Table 3 shows the change in average scores among participants including a comparison between those groups completing and not completing the intervention. Results suggested that only adolescents completing the intervention were more

likely to ask sexual partner to use any birth control or condom. Results also indicated that adolescents completing the intervention were more likely report intentions to engage in sexual intercourse. Nevertheless, a logistic regression analysis revealed that those completing the intervention reported 75% less probability of reporting sex ever than those non-completers (95% CI [0.063, 0.977], $p=0.046$) after controlling for age and gender.

Area	n	Mean ^a (SD) Exit Interview	Mean ^a (SD) Follow-up	p value	<i>d</i> ^b	1- β ^c
All participants						
Have sexual intercourse	180	4.19 (1.34)	3.98 (1.26)	0.055	0.16	0.69
Use (or ask your partner to use) any birth control method, if you were to have sexual intercourse	98 ^d	2.37 (1.70)	1.86 (1.29)	0.008	0.33	0.95
Use (or ask your partner to use) a condom if you were to have sexual intercourse	109 ^e	2.02 (1.52)	1.47 (0.92)	0.001	0.41	0.99
Abstain from sexual intercourse (choose not to have sex)	180	2.13 (1.58)	2.35 (1.34)	0.119	0.15	0.64
Intervention Completed						
Have sexual intercourse	170	4.25 (1.32)	3.97 (1.26)	0.014	0.22	0.88
Use (or ask your partner to use) any birth control method, if you were to have sexual intercourse	89	2.43 (1.74)	1.89 (0.89)	0.008	0.36	0.96
Use (or ask your partner to use) a condom if you were to have sexual intercourse	99	2.02 (1.52)	1.47 (0.95)	0.001	0.41	0.99
Abstain from sexual intercourse (choose not to have sex)	170	2.12 (1.59)	2.35 (1.36)	0.118	0.15	0.64
Intervention Not Completed						
Have sexual intercourse	10	3.20 (1.81)	4.10 (1.20)	0.081	0.56	0.5
Use (or ask your partner to use) any birth control method, if you were to have sexual intercourse	9	1.78 (1.09)	1.56 (0.73)	0.695	0.23	0.15
Use (or ask your partner to use) a condom if you were to have sexual intercourse	10	2.00 (1.63)	1.40 (0.52)	0.329	0.42	0.33
Abstain from sexual intercourse (choose not to have sex)	10	2.30 (1.49)	2.40 (1.17)	0.872	0.07	0.08
^a Likert scale; 1="much more likely" to 5="much less likely".						

^bEffect size=*d* the correlation between measures was considered in the calculation (Cohen's method).

^cPower obtained from the post-hoc analysis.

^d80 participants excluded from analysis due to indication of sexual abstinence at exit interview.

^e70 participants excluded from analysis due to indication of sexual abstinence at exit interview.

Table 3: Likelihood of engaging in sexual activity and use of contraceptive and birth control methods.

At the follow-up assessment, participants were asked for attitudes towards how difficult would be to engage or use any contraceptive method or disclose sexual intercourse to friends or parents (Table 4). In those regards, 11.9% of adolescents said that would be difficult to say "NO" to have sexual intercourse, 6.0% would be difficult to use a condom at the time of sex, 13.7% would be difficult to use any other

contraceptive method, 12.7% would find difficult try to negotiate condom use or any other contraceptive methods with sexual partner, 62.3% would find difficult to disclose a sexual relationship to a friend and 56.2% would find difficult to disclose a sexual relationship to their parents. No significant differences were found between those intervention completers and non-completers.

	Very difficult (%)	Difficult (%)	Nor easy nor difficult (%)	Easy (%)	Very easy (%)
Say "NO" to sex intercourse	12 (6.5)	10 (5.4)	64 (34.6)	36 (19.5)	63 (34.1)
Use condoms when having sexual intercourse	9 (4.9)	2 (1.1)	13 (7.1)	52 (28.4)	107 (58.5)
Use any other contraceptive method when having sexual intercourse	12 (6.6)	13 (7.1)	40 (21.9)	47 (25.7)	71 (38.8)
Accomplish that your sexual partner use condoms or any other contraceptive methods regardless of partner's preference	7 (3.8)	16 (8.7)	65 (35.3)	39 (21.2)	57 (31.0)
Disclose to friends that you had sexual intercourse	76 (41.5)	38 (20.8)	46 (25.1)	14 (7.7)	9 (4.9)
Disclose to parents that you had sexual intercourse	75 (40.5)	29 (15.7)	39 (19.5)	16 (8.6)	29 (15.7)

Table 4: Distribution of responses towards attitudes.

When participants were asked about considering having sex in the future, around 49.7% indicated high probability. When compared to those that indicated less probability at entry instrument (80.2%) about 54.9% of them remained under the same opinion. Among those adolescents that indicated not having sex before starting the intervention (n=167; 93.3%) 12.0% (n=20) indicated having sex after finishing ¡Cuidate!. Males reported higher incidence rate of sex than females, but not statistically significant (14.7% vs. 9.8%, p>0.05). From those reporting sex at follow-up, two females (10%) indicated being pregnant. From the adolescents that reported sex after participation of the program, 15 indicated having sex in the past year and from those 10 had sexual intercourse with only one individual. The remaining five adolescents reported had sex with two or three individuals already. From the 20 adolescents reporting sex in the past year before the follow-up, the male condom was the most frequently used and

preferred method of protection and contraception (100% males vs. 33.3% females) followed by IUD (9.1% males vs. 0% females); while there were no other methods indicated for contraception. When frequency of use was explored, seven males and three females indicated using at all the times any birth control method; while eight males and three females indicated condom use at all the times.

Table 5 showed a comparison on follow-up questions responses for dynamics while participating in the program. Obtained scores for interest and engagement were favorable. However, when comparing exit and follow-up data, the results indicated that interest about the program, learning activities, and chance to ask questions received statistically significant lower scores at follow-up assessment. A comparison between completers and non-completers showed that there were no statistical differences among the non-completers group.

Area	n	Mean ^a (SD) Exit Interview	Mean ^a (SD) Follow-up	p value	<i>d</i> ^b	1-β ^c
Did you feel interested in program sessions and classes?	183	4.60 (0.83)	4.22 (1.04)	0.000	0.40	0.98
Did you feel the material presented was clear?	183	4.70 (0.73)	4.70 (0.64)	0.934	0.00	0.05
Did discussions or activities help you to learn program lessons?	182	4.74 (0.67)	4.43 (0.98)	0.000	0.36	0.94
Did you feel respected as a person?	181	4.72 (0.76)	4.75 (0.75)	0.714	0.03	0.07

Did you have a chance to ask questions about topics or issues that came up in the program?	183	4.30 (1.07)	4.07 (1.20)	0.032	0.20	0.51
^a Likert scale; 1="None of the time" to 5="All of the time". ^b Effect size= <i>d</i> the correlation between measures was considered in the calculation (Cohen's method). ^c Power obtained from the post-hoc analysis.						

Table 5: Comfort level of adolescents on dynamics while participating in the Program.

Discussion

The purpose of the PR-PREP is to educate adolescents regarding abstinence, contraception and adulthood preparation topics to prevent unintended teen pregnancy and STIs. In Puerto Rico, teen pregnancy prevention is a public health concern and this program responds to address this situation. It is assumed that changes in knowledge, attitudes towards protection, condom or contraceptive use, and gain in life skills influence sexual behavioral change. Although this investigation found that an impact in knowledge and attitudes were experienced, the goal of preventing teen pregnancy did not reached statistical significance. Nevertheless, ¡Cúidate! resulted effective in changing the perception towards abstinence, condom utilization, and in reducing the number of sexual partners and delaying in age of first sexual encounter.

Despite knowledge and understanding of expected sexual behaviors were achieved, this does not imply changing behavior to reduce pregnancy during adolescence. Our findings may be associated with social and cultural determinants that were not addressed in this investigation. For example, studies had associated the socioeconomic disadvantage experienced at the community and family levels to contribute to the high teen birth rates [22,23]. In addition, social norms-connectedness and their interaction are other variables that influence behaviors [24]. Even more cohesive communities in which neighbors' cultural norms reproach inappropriate behaviors may influence adolescent behaviors like teenage childbearing [25]. Also, perceived positive consequences of teenage childbearing among female adolescents is associated with increased risk of sexual intercourse and unprotected sexual intercourse [26].

Empirical research supported that parents play a crucial protective role in the socialization and the adolescent sexual behavior [27]. The family connectedness and a positive parent-child relationship may be a protective factor related to adolescents' sexual risk behaviors [28]. However, the participation of parents in a concurrent classroom-based intervention ¡Cúídalos! [29] did not moderated any of the outcomes presented. The presence of pregnant or parenting adolescent in the immediate family is another variable not considered in this investigation. Research indicated it can increase the probability that a younger sibling become pregnant in the adolescence [30]. Also, Latina adolescent parents are at increased risk for rapid repeat births, STIs, and negative educational and social outcomes [31].

When comparing PR-PREP ¡Cúidate! findings with the YRBSS 2015 results, there is a lower percent of adolescents that indicated ever had sexual intercourse (15.7% vs. 23.8%) or currently active (6.3% vs. 15.7%). A closer examination after participation in the program stratifying by gender presents that females and males reported sexual activity in 9.9% and 14.7%, respectively in comparison to 16.3% and 15.0% for females and males in the YRBSS study, respectively. When, exploring condom use among those sexually active, the YRBSS

indicated that 49.6% of females and 53.7% of males did not use a condom, while 25% of female and 7.1% of male PR-PREP participants did not reported condom use. In comparison to the YRBSS, 4.7% of adolescents indicated sexual intercourse with four or more persons while none of the PR-PREP participants indicated had this behavior. This comparison suggests ¡Cúidate! was effective in increasing abstinence and among those sexually active increase in condom use for both females and males.

In terms of births for 2015 within selected municipalities, 3.8% of females 15-19 years reported births in the past 12 months, while PR-PREP females reported 6.9%. This finding might suggest that intervention could be efficient in increasing knowledge and understanding of sexual behaviors but change in behavior requires more resources and attention than a single short-term intervention. Similarly to the study of Kelsey and others [17] life skills and use of any contraceptive or condom reported significant probability rates of use at follow-up interview among those completing the intervention versus those adolescents indicating non-completion. However, the primary outcome of pregnancy prevention experienced a trend. Even though the control trial was not finished, and the outcomes was measured at 6-months, authors suggested that a longer period might provide the opportunity to incorporate long-term impact in the life of adolescents but not necessarily associated with the influence in sexual behavior.

Limitations

Due to limited resources, we were unable to compare the real impact of ¡Cúidate! intervention in the community/school setting due to the lack of a control group. Since the PR-PREP was funded to provide services only, the inclusion of a control group was not possible. Future research and evaluation must consider the inclusion of a control group to identify the impact of the intervention in real settings. Nevertheless, comparison among those that finished 5 or 6 sessions and less than 5 sessions provided an opportunity to determine how significant was to receive complete rather than partial intervention. Additionally, integrating a control group and other variables influencing changes in behavior at long-term could lead to better understanding of the real impact of the intervention.

Limited resources to engage all participants in the impact evaluation was experienced. Further consideration for future prevention strategies interventions should include the evaluation research component from the planning phase. This will ensure a systematic data collection and provide better evidence of impact. Even though the sample was adequate, by increasing the sample size, larger representation can be attained increasing power of statistical analyses and further exploration of information in subgroups with small representation of participants such among those not completing the intervention, those reporting sexual activity and by municipalities.

Even though different methods have been explored to collect information regarding sexual behaviors among adolescents, in this study we use self-administer questionnaire. Despite critics this is an adequate method to generate estimates among adolescents when asking for sensitive information such as substance use and sexual behaviors because of confidentiality [32,33]. Finally, recall bias should be considered in this prospective study. Despite cohort studies are less likely to experience this type of bias than case-control studies it could be a threat when asking respondents of past experiences [34]. In this study, the extended period without a systematic or consistent procedure from exit interview to follow-up brought lapses in which participants were referenced to the specific color's uniform, school location, or traits of facilitators or the program to remember about ¡Cuidate! intervention. In these cases, once the connection was made then the questionnaire was provided to participants.

Conclusion

¡Cuidate! seems to be a good fit for the population served and was effective in changing the perception towards abstinence, condom utilization, and keep low the number of sexual partners and partially delayed age of first sexual intercourse. This intervention has been delivered in school and community settings in Puerto Rico and is an appropriate, scientific validated option to complement existing sexual risk prevention programs.

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Authors Contribution

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