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## High School Students in a Health Career Promotion Program Report Fewer Acts of Aggression and Violence

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### Abstract

**Purpose**—This study examined the effects two school-based programs on the perpetration of Non-Physical Aggression, Physical Violence, and Intimate Partner Violence among high-risk secondary school students in an economically disadvantaged and predominantly Latino school district. The intervention program was El Joven Noble; the control program was the Teen Medical Academy.

**Methods**—The study used a repeated measures quasi-experimental intervention/control design. The participants self-reported past thirty day acts of Non-Physical Aggression, Physical Violence, and Intimate Partner Violence at baseline and at three and nine months post enrollment. Program and grade level effects at three and nine months were examined using three factor Analyses of Covariance Models (ANCOVAs) with one factor for repeated measures. The covariate in each of the models was the baseline measure of the dependent outcomes.

**Results**—No significant baseline differences were found between the participants in the intervention (n=96) and control (n=127) programs. At nine months post enrollment in the study, high school students who participated in the Teen Medical Academy reported fewer acts of Non-Physical Aggression ( $p < .001$ ), and Physical Violence ( $p = .002$ ), than high school students who participated in El Joven Noble. Students who participated in the Teen Medical Academy also reported fewer acts Intimate Partner Violence ( $p = .02$ ) than students who participated in El Joven Noble.

**Conclusions**—High school students who participated in a health career promotion program reported fewer acts of aggression and violence as compared to high school students who participated in a culturally tailored character development program.

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## Keywords

Violence; Latino; Adolescent; Prevention

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## Introduction

Violence continues to be a major source of mortality and morbidity for youth in the United States of America (USA). On average, fourteen young people between the ages of twelve and twenty-four in the USA die from homicide each day.[1] This makes violence the second leading cause of death for American adolescents and young adults.[2]

Significant racial and ethnic disparities exist in regard to youth violence. The youth homicide rate for African-American, Latino, and Non-Latino Whites is 32.4, 11.8, and 2.5 per 100,000 respectively.[1] Violence persists as the leading cause of death for African-American youth, and Latinos are nearly five times more likely to be a victim of homicide than Non-Latino white youth.[2,3] Though the homicide rate for African-American youth is higher, in the southwestern USA (Arizona, California, Colorado, Nevada, New Mexico, Texas, and Utah) more Latinos than African-Americans die as a result of homicide.[2] Currently, twenty-four percent of the children in the USA are Latino.[4] As the proportion of Latino youth continues to rapidly increase, finding effective violence prevention strategies for youth in Latino communities becomes increasingly important.

As compared to students in regular public schools, Latino students in alternative schools are twice as likely to experience violence.[5,6] Results of the National Alternative School Youth Risk Behavior Survey (YRBS) showed that sixty percent of Latino students in alternative schools had been in a physical fight in the past twelve months and thirty-four percent had carried a weapon in the past thirty days. Twenty-five percent had been in a physical fight on school property and sixteen percent had been threatened or injured with a weapon on school property in the past twelve months.[6] The 2009 YRBS indicated that twelve percent of Latino high school students had been hit or slapped by an intimate partner in the past twelve months and eight percent had been forced to have unwanted sexual intercourse at some point during their lives.[7]

Systematic reviews have shown that school-based violence interventions, especially those designed to improve relationship or social skills, can decrease aggressive behaviors.[8–10]. Violence prevention programs demonstrate increasing effectiveness as the level of intervention increases from primary to tertiary.[11] Consistent with these reviews, a previous prospective school randomized controlled trial demonstrated that participation in *El Joven Noble*, a culturally tailored character development program, was effective as a secondary violence prevention strategy among elementary school children in an economically disadvantaged and predominantly Latino school district.[12]

In this study, a multidisciplinary team of academic researchers address Latino youth violence by continuing to partner with the same local community and school district. The purpose of this study was to determine the effects of participation in *El Joven Noble* on the perpetration of violence among high-risk middle and high school youth in the district's alternative school, the Disciplinary Alternative Education Program (DAEP). The study examines program effects on the perpetration of acts of Non-Physical Aggression, Physical Violence, and Intimate Partner Violence. The Teen Medical Academy, a health career promotion program, was implemented as the control program.[13]

We hypothesized that students who participated in the intervention program, El Joven Noble, would report fewer acts of aggression and violence than students who participated in the control program, the Teen Medical Academy.

## Methods

### Protection of Human Subjects

The study protocol was reviewed and approved by the Institutional Review Board of the University of Texas Health Science Center at San Antonio. A Certificate of Confidentiality was obtained from the National Institutes of Health. Parental consent and child assent was obtained in writing prior to participation in the study.

### Study Setting

The study was conducted with students in the Disciplinary Alternative Education Program (DAEP) of one economically disadvantaged and predominantly Latino school district. Students are referred for placement in the DAEP from one of five middle or three high schools. On average, 300 students are placed in the DAEP each year. Approximately seventy percent of the students are referred for violence, while thirty percent are referred for substance use. The most frequent violence related offenses are persistent disruptive conduct, mutual fighting, assault on another student, and participation in gang activity. The most frequent substance use offenses are possession, distribution, or use of marijuana or other controlled substances. Both middle and high school DAEP students attend school on the same campus, but in grade segregated classrooms. Most students are placed in the DAEP for six weeks.

### Study Design

The study used a quasi-experimental intervention/control with repeated measures design. In year one, high school students in the DAEP were invited to participate in El Joven Noble, while middle school students in the DAEP were invited to participate in the control program, the Teen Medical Academy. In year two, high school students in the DAEP were invited to participate in the Teen Medical Academy, while middle school students in the DAEP were invited to participate in El Joven Noble. Previous participation in either arm of the study was an exclusion criterion in year two.

A continual recruitment, enrollment, and withdrawal design that matched the flow of students in and out of the DAEP was used. As students entered the DAEP they were invited to participate in the study. After obtaining parental consent and child assent, students were eligible to participate for the duration of their placement. Thus, at each session it was possible for new students to join, while others withdrew from the study.

### Description of the Intervention and Control Programs

Both the intervention and control programs consisted of a series of eighteen 45-minute sessions that were conducted twice a week. Participants opted out of their daily life skills class on Tuesday and Thursday to participate. In this study, students participated in a mean of 6.4 sessions.

El Joven Noble is a culturally tailored character development program that focuses on establishing and maintaining healthy relationships with self, family, intimate partners, community, and culture.[14] It uses a variety of interactive educational strategies including story-telling, small group discussions, crafts, and Native American talking circles. The activities strive to facilitate an attachment to, commitment to, involvement with, and belief in a non-violent cultural identity that replaces violence provoking norms and attitudes with

beliefs that support harmony and balance in all relationships. In a prior Community Based Participatory Action Violence Prevention Research study, local community members selected El Joven Noble as an intervention and were trained to implement the program with elementary school children.[12] In this study, three trained and experienced Latino community facilitators and a Latino project coordinator implemented the sessions of El Joven Noble. The facilitators and project coordinator were in their late forties.

The Teen Medical Academy is a health career promotion program that focuses on common medical conditions frequently managed by primary care physicians.[13] The sessions focus on teaching human anatomy and pathology with the use of hands-on diagnostic and therapeutic medical equipment. In the Teen Medical Academy sessions, participants learned how to manage and treat lacerations, non-displaced fractures, asthma, heart attacks, liver disease, and gall stones. One Family Medicine faculty member, one Family Medicine resident (while on a Community Medicine rotation), one trained community facilitator, and a project coordinator implemented the sessions of the Teen Medical Academy. The average age of the Family Medicine residents was about thirty; the other facilitators were in their late forties.

### Data Collection

Participants self-reported past thirty day perpetration of acts of Non-Physical Aggression, Physical Violence, and Intimate Partner Violence through a confidential questionnaire at baseline and at three and nine months post enrollment in the study. Baseline data was collected at the DAEP, while three and nine month data was collected in participants' homes by trained community data collectors. Participants received a twenty dollar gift card at each data collection point.

### Aggression and Violence Measures

A twelve item Non-Physical Aggression scale (Cronbach's alpha=.90) assessed the perpetration of six forms of aggression in and out of school. The items were from an existing scale.[15] The six forms of Non-Physical Aggression assessed were getting angry easily with someone, teasing someone to make them angry, saying things about someone to make others laugh, calling someone bad names, encouraging someone to fight, and threatening to hurt or hit someone. The written prompt and time frame were altered from the original scale. The prompt was "*The following is a list of things that may have happened within the past 30 days. Within the past 30 days how many times have each of the following happened?*" The response options were "*0, 1, 2, 3, 4, 5, or 6+*". The number of acts of Non-Physical Aggression perpetrated in the past 30 days was calculated as the mean of the responses to the twelve items multiplied by twelve. A value of six was assigned to any "6+" response.

An eight item Physical Violence scale (Cronbach's alpha=.88) assessed the perpetration of four forms of violence in and out of school. The items were from an existing scale.[15] The four forms of Physical Violence assessed were pushing or shoving someone, slapping or kicking someone, getting into a physical fight, and fighting back when someone hit you first. The written prompt, time frame, response options, and scoring were the same as for the Non-Physical Aggression scale. The number of acts of Physical Violence perpetrated in the past 30 days was calculated as the mean of the responses to the eight items multiplied by eight.

A sixteen item Intimate Partner Violence scale (Cronbach's alpha=.93) assessed the perpetration of sixteen forms of violence. The items were from an existing scale.[16] The sixteen items included forms of violence ranging from scratching to beating up a partner. The written prompt, time frame, and response options were altered from the original scale.

The prompt for the Intimate Partner Violence items was “*The following is a list of possible things that may have happened with a boyfriend or girlfriend within the past 30 days. Within the past 30 days how many times have each of the following happened with a boyfriend or girlfriend. I ...*” The response options and scoring were the same as for the previous scales. The number of acts of Intimate Partner Violence perpetrated in the past 30 days was calculated as the mean of the responses to the sixteen items multiplied by sixteen.

## Data Analysis

Chi squares analysis and analysis of variance were used to assess group differences in recruitment, retention, and participant characteristics. Bivariate correlation analysis was used to determine if potential predictors were associated with the aggression and violence measures.

Program and grade level effects at three and nine months were examined with three factor Analyses of Covariance models (ANCOVAs).[17,18] Each model included one repeated factor for time (three and nine months post enrollment in the study), one between-groups factor for program (El Joven Noble vs. the Teen Medical Academy), and one between-groups factor for grade level (middle vs. high school). The covariate in each of the models was the baseline measure of the respective dependent aggression or violence measures.

Assumptions for ANCOVA were tested and analyses of homogeneity-of-regression slopes demonstrated that there was not a significant interaction between the covariates and the between-group factors. Because the distributions for the aggression and violence measures were non-normal they were log transformed. The results were similar using the log transformed and untransformed measures. For ease of discussion and interpretation, the untransformed means are reported in Tables 4 and 5.

When interactions were present in the ANCOVA models, post hoc analyses with pairwise comparisons were conducted. A Sidak adjustment for multiple comparisons was used to determine statistical significance.[19] Adjusted p-values from the post hoc analysis are reported.

## Results

### Recruitment and Retention

Table 1 displays study recruitment and retention data. Middle school students were recruited at a lower rate than high school students ( $p < .001$ ). No data was collected on students who chose not to participate. The nine month retention rate differed significantly by program, 66% for El Joven Noble and 84% for the Teen Medical Academy ( $p < .001$ ). No statistically significant differences in baseline mean level of violence were found between participants retained at nine months and those lost to follow up in either arm of the study ( $p > .11$ ). The analyses below are restricted to participants retained at nine months.

### Participant Characteristics

Table 2 displays pertinent participant characteristics. The middle school students were younger than the high school students ( $p < .001$ ). Ninety percent of the participants were Latino, seventy-four percent were male, and eighty-six percent reported having a boyfriend or girlfriend. Students participated in a mean of 6.4 sessions of the programs. No statistically significant differences in the mean number of self-reported past thirty day acts of aggression or violence were detected at baseline.

## Bivariate Correlation Analysis

The bivariate correlation analysis demonstrated that grade level was associated with the aggression and violence outcome measures ( $p < .10$ ). Latino ethnicity, gender, and number of sessions attended were not significantly correlated with the dependent outcome variables ( $p > .10$ ). Thus, grade level was entered as a factor in the ANCOVA models. Latino ethnicity, gender, and number of sessions attended were not entered as factors.

## Three Repeated Measures ANCOVA Models

Table 3 displays the F- statistics for the main effects, pertinent interactions, and the covariate in each of the three repeated measures ANCOVA models. The Non-Physical Aggression and Physical Violence models detected a time by program by grade level interaction effect. The Intimate Partner Violence model detected program and grade level effects, but no interaction effects. The covariate, baseline aggression or violence, was significant in all of the models.

**Non-Physical Aggression and Physical Violence**—Table 4 reports the mean number of acts of Non-Physical Aggression and Physical Violence by time, program, and grade level. At nine months post enrollment in the study, high school students who participated in the Teen Medical Academy reported fewer acts of Non-Physical Aggression ( $p < .001$ ) and Physical Violence ( $p = .002$ ) than high school students who participated in El Joven Noble. No statistically significant differences were detected between middle school students who participated in El Joven Noble and middle school students who participated in the Teen Medical Academy at either three or nine months. The adjusted p-values for the pairwise comparisons at three and nine months between the high school students who participated in the Teen Medical Academy and middle school students who participated in El Joven Noble were  $p < .03$  for Non-Physical Aggression and  $p < .04$  for Physical Violence.

**Intimate Partner Violence**—Table 5 reports the mean of the number of acts of Intimate Partner Violence reported at three and nine months by program and grade level. Students who participate in the Teen Medical Academy reported fewer acts Intimate Partner Violence ( $p = .02$ ) than students who participated in El Joven Noble.

## Conclusions

In this study, neither middle nor high school students who participated in the intervention program, El Joven Noble, reported fewer acts of aggression or violence than students who participated in the control program, the Teen Medical Academy. An unexpected finding was that high school students who participated in the health career promotion program reported significantly fewer acts of Non-Physical Aggression and Physical Violence than high school students who participated in the culturally tailored character development program. In addition, students who participated in the Teen Medical Academy reported fewer acts of Intimate Partner Violence than students who participated in El Joven Noble.

A qualitative study among participants of the program would be helpful to interpret the findings of the study. One potential explanation is to interpret the findings with the use of the theoretical framework of Positive Youth Development that suggests that the best approach to decreasing health risk behaviors among youth is to focus on promoting their access to positive life options.[20] In a previous prospective randomized controlled study among high school students in regular public schools, participation in the Teen Medical Academy significantly predicted greater interest in medical and allied health careers; confidence in the ability to achieve a health career and learn technical skills; and sense of belongingness in a health career and among doctors.[13] These outcomes were not measured

in this study. If high school students in the DAEP who participated in the Teen Medical Academy had similar outcomes, it might be that stimulating an interest and developing self-efficacy in a positive life option like a career in the health professions may have contributed to decreased levels of aggression and violence.

A limitation of the study is that it used a quasi-experimental design. Unfortunately, structural constraints within the DAEP limited the ability to use a randomized experimental design. An unidentified selection bias may have influenced the results of the study. Though the recruitment rates were similar within grade levels, differences in the content and structure of El Joven Noble and the Teen Medical Academy may have selected for students with different traits that were not measured.

The difference in nine month retention rates suggests that differences may exist between the students who chose to participate in the two programs. More participants in El Joven Noble were lost to follow-up. They may be in a less stable social situation that made them more difficult to locate. A less stable social situation, however, could increase their risk for violence, thus the study findings may be a conservative estimate of differences in program effects. Another possible explanation for the unequal retention rates may be that separate teams were responsible for data collection for El Joven Noble and the Teen Medical Academy. The unequal retention rates may have resulted from different levels of effectiveness in obtaining follow-up surveys between the two teams. Randomizing data collection responsibilities in future studies may be helpful.

Another limitation is that the study did not include a “standard treatment arm”. We did not measure violence among DAEP students who did not participate in either of the programs and were thus unable to make comparisons. It may be that levels of violence decrease with time among most DAEP students. A three armed prospective randomized controlled trial would provide a stronger design to test the effectiveness of the programs as violence prevention strategies among high-risk secondary school youth.

In this study, the number of sessions attended was not associated with the number of self-reported acts of aggression or violence. A potential explanation is that, in the DAEP setting, students who participated in a greater number of sessions included those who were originally placed in the DAEP for a longer period of time due to a more serious violence offense and/or those who continued to engage in behaviors that prolonged their placement in the DAEP.

The study findings suggest that participating in a health career promotion program may be an effective youth violence prevention strategy for high-risk high school students in Latino communities. Engaging in fewer acts of aggression and violence is clinically significant because it decreases the risk that youth or their peers, family members, or intimate partners will sustain a non-fatal or fatal violence related injury. Discovering effective violence prevention strategies to create safer environments for youth in high-risk communities should continue to be an adolescent health concern and priority.

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### Implications and Contribution

Violence persists as the second leading cause of adolescent mortality and disproportionately effects ethnic minority youth. The study findings suggest that a health career promotion program may be an effective Latino youth violence prevention strategy. The effects of this type of intervention on youth violence have not been previously reported.

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**Table 1**

Recruitment and Retention Data

	Intervention Program		Control Program		Chi-Square
	EJN MS	EJN HS	TMA MS	TMA HS	
<b>Number Enrolled</b>	75	71	77	75	
<b>Number Invited to Participate</b>	179	109	153	119	
<b>Recruitment Rate</b>	42%	65%	50%	63%	20.5 <sup>***</sup>
<b>Three Month Retention Rate</b>	81%	86%	94%	83%	5.6
<b>Nine Month Retention Rate</b>	59%	73%	84%	83%	16.7 <sup>***</sup>

EJN= El Joven Noble, TMA= Teen Medical Academy, MS= Middle School, HS= High School

\*\*\*  
p<.001

Table 2

## Participant Characteristics

	Intervention Program		Control Program		F or Chi-Square
	EJN MS n=44	EJN HS n=52	TMA MS n=65	TMA HS n=62	
Age <sup>^</sup>	14.0 (.1)	16.3 (.2)	13.7 (.1)	16.6 (.1)	119.1***
Age Range	12–16	14–19	12–16	14–19	
Percent Latino	84	92	89	94	3.0
Percent Male	71	81	71	74	1.9
Percent with Boy or Girlfriend	83	85	81	95	5.6
Number of Sessions Attended <sup>^</sup>	5.4 (.6)	6.5 (.5)	6.8 (.5)	6.6 (.5)	1.3
<b>Baseline Number of Self-Reported Past Thirty Day Acts of Aggression and Violence</b>					
Non-Physical Aggression <sup>^</sup>	20.9 (2.6)	24.1 (2.4)	24.7 (2.1)	23.8 (2.6)	0.4
Physical Violence <sup>^</sup>	18.2 (2.1)	15.4 (1.9)	15.0 (1.6)	13.7 (1.8)	1.0
Intimate Partner Violence <sup>^</sup>	13.4 (3.1)	5.2 (1.3)	6.9 (1.7)	8.0 (2.2)	2.5

EJN= El Joven Noble, TMA= Teen Medical Academy, MS= Middle School, HS= High School

<sup>^</sup> Mean (SEM),

\*\*\*p<.001

**Table 3**

Results of the Three Repeated Measures ANCOVA Models<sup>^</sup>

	Main Effects			Interactions			Covariate
	Time	Program	Grade Level	Time by Program by Grade Level	Program by Grade Level	Baseline Aggression or Violence	
Non-Physical Aggression	.2	6.0**	4.7**	8.2***	5.3**	40.5****	
Physical Violence	.7	8.2***	3.5	2.6*	1.6	54.9****	
Intimate Partner Violence	.0	5.8**	4.2**	0.1	0.7	18.2****	

<sup>^</sup> F-statistics are reported

\* p<.11,

\*\* p<.05,

\*\*\* p<.01,

\*\*\*\* p<.001

**Table 4**

Mean Number of Acts of Aggression and Violence by Time, Program, and Grade Level

	Intervention Program		Control Program	
	EJN MS n=44	EJN HS n=52	TMA MS n=65	TMA HS n=62
<b>Non-Physical Aggression</b>				
Three Months <sup>^</sup>	24.3 (.4) <sup>+</sup>	15.8 (.3)	16.4 (.3)	13.5 (.3)
Nine Months <sup>^</sup>	16.5 (.4) <sup>*,+</sup>	18.6 (.3) <sup>+++</sup>	15.9 (.3) <sup>+++</sup>	9.3 (.3) <sup>**</sup>
<b>Physical Violence</b>				
Three Months <sup>^</sup>	14.9 (.3) <sup>+</sup>	10.6 (.2)	10.5 (.2)	9.4 (.2)
Nine Months <sup>^</sup>	10.5 (.3) <sup>+</sup>	11.2 (.2) <sup>++</sup>	8.6 (.2) <sup>+</sup>	6.1 (.2) <sup>*</sup>

EJN= El Joven Noble, TMA= Teen Medical Academy, MS= Middle School, HS= High School

<sup>^</sup> Mean (SEM)<sup>\*</sup> Time Effect (3 months vs. 9 months):<sup>\*</sup> p<.05,<sup>\*\*</sup> p<.01<sup>+</sup> Program by Grade Level Effect as compared to TMA HS:<sup>+</sup> p<.05,<sup>++</sup> p<.01,<sup>+++</sup> p<.001

**Table 5**

Mean Number of Acts of Intimate Partner Violence with Program and Grade Level Effects

	Program Effects		Grade Level Effects	
	EJN n=96	TMA n=127	MS n=109	HS n=114
<b>Intimate Partner Violence</b> <sup>^</sup>	8.9 (.1) <sup>+</sup>	5.3 (.1) <sup>+</sup>	8.4 (.1) <sup>#</sup>	5.9 (.1) <sup>#</sup>

EJN= El Joven Noble, TMA= Teen Medical Academy, MS= Middle School, HS= High School

<sup>^</sup> Mean (SEM),<sup>+</sup> Program Effect:<sup>+</sup> p<.05,<sup>#</sup> Grade Level Effect:<sup>#</sup> p<.05