Title

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Journal

Pediatrics, 149(3)

ISSN

0031-4005

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Publication Date

2022-03-01

DOI

10.1542/peds.2021-050861

Peer reviewed

Early Sexual Debut and Neighborhood Social Environment in Latinx Youth

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abstract

OBJECTIVES: To examine whether social aspects of the neighborhood environment are associated with early sexual initiation in a California agricultural community of predominantly Latinx adolescents.

METHODS: In a prospective cohort study of 599 eighth graders recruited from middle schools in Salinas, California (2015–2019), participants completed five interviews over 2 years. Social environment measures included neighborhood social dynamics (neighborhood disorder, social cohesion, and social network gang exposure); experiences of discrimination; and school connectedness. We estimated associations between baseline social environment and early sexual initiation (<15 years) using Poisson regression with robust standard errors. We compared contraceptive self-efficacy and attitudes by sexual initiation status using ANOVA.

RESULTS: Most youth were Latinx (94%) and age 13 (70%) at enrollment; 53% were female and 49% had a parent employed in agriculture. Additionally, 14% reported first vaginal sex before age 15. Neighborhood disorder (relative risk [RR], 1.13; 95% confidence interval [CI], 1.05–1.21), social network gang exposure (RR, 2.23; 95% CI, 1.49–3.33), and experiences of discrimination (RR, 1.67 [1–2 events versus none], 95% CI, 1.09–2.55; RR, 2.33 [3+ events versus none], 95% CI, 1.07–4.64) were associated with early sexual initiation. School connectedness was protective (RR, 0.44, 95% CI, 0.29–0.69). Youth who initiated sex before age 15 had more negative birth control attitudes and expressed lower motivation to use contraceptives.

CONCLUSIONS: Findings underscore opportunities to promote early adolescent sexual health through strengthening supportive and safe neighborhood environments with the promise of addressing disparities in unintended pregnancy and sexually transmitted infection rates in later adolescence.

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Dr Minnis conceptualized and designed the study, drafted, revised, and finalized the manuscript; Ms Browne conducted the statistical analysis and drafted the analysis and results sections of the manuscript; Ms Chavez contributed to study development, coordinated data collection and contributed to conceptualizing the analysis; Ms McGlone contributed to conceptualization and design of the study, interpretation of data and review of the manuscript; Drs Raymond-Flesch and Auerswald contributed to conceptualization of the study, analysis and interpretation of data, and review of the manuscript; and all authors reviewed and approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

DOI: https://doi.org/10.1542/peds.2021-050861

Accepted for publication Nov 10, 2021

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WHAT'S KNOWN ON THIS SUBJECT Social environment factors underlie many health disparities experienced by minority populations in the United States. The relative salience of social determinants on adolescent sexual health in an agricultural community shaped by immigration is largely unexamined.

WHAT THIS STUDY ADDS This prospective study shows that multiple dimensions of neighborhood social environments, both protective and risk, were associated with early sexual initiation. Identifying strategies to strengthen assets and mitigate risks is critical to reducing sexual health disparities experienced by Latinx adolescents.

To cite: Minnis AM, Browne EN, Chavez M, et al. Early Sexual Debut and Neighborhood Social Environment in Latinx Youth. *Pediatrics*. 2022;149(3):e2021050861

Substantial declines in teen birth rates have been achieved in the United States across all racial and ethnic groups; however, rates nonetheless remain higher than in any developed nation with persistent disparities.[1] Reported cases of sexually transmitted infections (STIs), chlamydia, gonorrhea and syphilis, have increased dramatically since 2015 with inequities in the social determinants of health contributing to racial and ethnic disparities in STI incidence.[2] The birth rate for Latinas aged 15 to 19 is more than twice that for non-Latina Whites,[3] with three-quarters of teen pregnancies unintended.[4] Parenting by female and male teens is tied to lower educational attainment, intergenerational socioeconomic disadvantage, and poorer child health outcomes.[5–7] Similarly, STI incidence is disproportionately higher for Latinx youth: chlamydia rates are three times higher among Mexican Americans than non-Latinx Whites aged 15 to 24.[8]

Identifying factors that affect sexual health behaviors in early adolescence constitutes an important component of addressing health disparities in later adolescence. The emergence of sexuality and the initiation of sexual activity are typical events of adolescence. However, early initiation of sexual intercourse (before age 15) is one marker of sexual risk that has been associated with teen pregnancy, unintended pregnancy in early adulthood, and STIs.[9–11] National data indicate that between 2005 and 2015, the proportion of high school students who report sexual intercourse has decreased significantly to 41.2% overall; 24.1% of ninth graders.[12] National Survey of Family Growth (NSFG) data indicate that decreases in adolescent sexual initiation during the period 2006 to 2019 primarily reflect changes before age 17 and among males.[13] Several pathways linking early sexual initiation with later adverse outcomes have been elucidated, including increased numbers of partners, longer duration between sexual debut and initiation of contraceptive use, relationship power imbalances, and limited access to reproductive health services.[9,14–17] Much of the research guiding prevention approaches for US adolescents has focused on individual-level risk and protective factors; yet, research understanding social environment effects on early sexual initiation is limited.[18,19]

The overall objective of this paper is to assess prospectively whether dimensions of the neighborhood social environment in early adolescence are associated with early sexual initiation. This work addresses gaps in understanding the role of social dynamics in neighborhoods on sexual health,[20,21] focusing on Latinx adolescents residing in the urban center of a California agricultural county. We examine multiple dimensions of neighborhood social dynamics and environment: neighborhood social cohesion; school connectedness, experiences of race or ethnicity-based discrimination, neighborhood disorder, and exposure to gangs through social networks. All factors reflect adolescents' perceptions of their social context. Finally, we assess whether contraceptive attitudes, self-efficacy, and use differ by sexual initiation.

METHODS

Study Setting and Design

A Crecer: The Salinas Teen Health Study is a prospective cohort study designed to examine social and structural influences on sexual health during the transition from early to middle adolescence.[22] Male and female eighth graders attending public middle school in Salinas were enrolled and followed for 2 years, with in-person study visits every 6 months (5 visits total). The Salinas Valley in California's central coast is an established migration destination for agricultural sector employment. While poverty and social disadvantage affect opportunities for adolescents in the region, community leaders sustain a commitment to strengthening environments that promote wellbeing and to address the social and economic determinants of health that contribute to adolescent health.

Recruitment procedures aimed to achieve a diverse sample of students, balanced by sex, at all 4 public middle schools (~150 participants per school) in the district. Each school had neighborhood-based catchment boundaries. Recruitment was informed by formative research, youth advisors, and our community advisory board.[22,23] Eligibility criteria included being enrolled in eighth grade, aged 12 to 15 years old, able to speak English or Spanish, intending to live in Salinas for the next year, and willing to provide contact information for a parent. Bilingual and bicultural research staff contacted parents to obtain permission for study participation by telephone. Youth provided written assent at enrollment. The RTI International Institutional Review Board approved all procedures.

Data collection took place after school, during evenings, and on weekends in community-based locations or at the *A Crecer* study office in central Salinas. Interviewers administered the computer-based questionnaire, with sensitive questions completed independently by participants using audio computer-assisted self-interviewing

(ACASI). Participants received visit completion incentives and a referral guide to community resources.

The *A Crecer* study enrolled 599 eighth graders between November 2015 and March 2017. A total of 1081 adolescents were recruited; a household member was reached by telephone for 80%, with 92% of parents providing permission for participation, resulting in 75% of youth whose parents provided permission being enrolled. Enrollment was halted when the target sample size of 600 was reached. Study retention was 92% at the final, 24-month study visit, with 88% completing all visits.

Measures

Exposures: Neighborhood Social Environment

Table 1 presents the social environment measures, including all items and response options with reliability coefficients. Protective neighborhood social dynamics measures included neighborhood social cohesion[24] and school connectedness.[25] Social cohesion was measured using 5 items developed by Sampson et al.[24] that include statements such as "people in my neighborhood are willing to help each other." We measured school connectedness using 8 items, 5 that comprised the assessment in the National Longitudinal Study of Adolescent to Adult Health (Add Health),[25] 2 from the California Healthy Kids Survey and 1 culturally-based item informed by formative research. Responses were averaged to create composite scores, with higher scores indicating greater social cohesion or school connectedness.

Adverse social dynamics measures included experiences of discrimination, neighborhood disorder, and gang exposure through friends. Self-reported experiences of racial or ethnic discrimination in the past 6 months were assessed for 7 situations in Krieger et al's Experiences of Discrimination Scale.[26] We categorized the count of the number of situations in which discrimination was reported, and its frequency, following recommended scoring. Neighborhood disorder was measured by the frequency of experiencing 11 events during the past year (eg, "I saw people dealing drugs near my home" and "Someone

TABLE 1 Description of Social Environment Measures

Measure	Response Option
Neighborhood social cohesion, 5-items (Cronbach's $\alpha = 0.76$). I am going to ask you some questions about your neighborhood, and you can tell me how much you agree or disagree	
People in my neighborhood are willing to help each other.	1: Strongly disagree
My neighborhood is close-knit.	2: Disagree
People in my neighborhood can be trusted	3: Agree
People in my neighborhood generally don't get along with each other.	4: Strongly agree
People in my neighborhood do not share the same values.	
School connectedness, 8-items ($\alpha = 0.79$). I would like you to tell me how much you agree or disagree with some statements about your school.	
I feel close to people at this school.	1: Strongly disagree
I feel like I am part of this school.	2: Disagree
I am happy to be at this school.	3: Agree
The teachers at my school treat students fairly.	4: Strongly agree
I feel safe in my school.	
I care what my teachers think of me.	
Doing well in school is important to me.	
My teachers respect my cultural background.	
Experiences of discrimination, 7-items. In the last 6 months have you experienced discrimination, been hassled, or "put down", because of your ethnicity or race in any of the following situations? If Yes, how many times did this happen?	
School	If Yes:
Getting a job	1: Once
Getting medical (health) care	2: 2 or 3 times
Store where you were shopping or a restaurant	4: 4 or more times
Neighborhood part or recreation program	
On the street	
From the police	
Neighborhood disorder, 11-items. How often in the last year have each of the following things happened in your neighborhood?	
I heard adults arguing loudly on my street.	0: Never
I saw strangers who were drunk or high hanging out near my house.	1: Once
I saw people dealing drugs near my home.	2: A few times
In the last year, I heard neighbors complaining about crime in our neighborhood.	3: Often
Someone I knew was arrested or sent to jail.	
People in the neighborhood complained about being harassed by police.	
There was a shooting near my home.	
In the last year, I saw cars speeding or driving dangerously on my street.	
A family member was stopped and questioned by police.	
A friend was robbed or mugged.	
I heard gunshots near my home.	
Social network gang exposure, 4-items. How many of your close friends . . . ; how many of the people you spend time ("hang out") with now . . .	
belong to a gang or claim a color?	1: None
are associated with a gang or color (but don't claim)?	2: Some
	3: Most
	4: All

I knew was arrested or sent to jail"). Items were drawn from the 11 item neighborhood disorder subscale of Ewart et al.'s City Stress Inventory,[27] which was developed and validated for use with adolescents in a low income urban setting. A composite score reflected a count of the total number of events occurring at least once during the past year. Social network gang exposure was defined based on participant report that at least some of their close friends or the people they spent time with currently (past 6 months) were in or affiliated with a gang.

Primary Outcome: Early Sexual Initiation

We defined early sexual initiation as vaginal sex prior to age 15. To capture sexual initiation that occurred outside of study visit reference periods (ie, due to missed visits), at the 24-month visit we assessed vaginal sex ever and age at first sex. Thus, the outcome of age at sexual initiation was based on prospective data, with 24-month reports completing any missing data over the follow up period.

Additional Measures: Contraceptive Attitudes and Self-efficacy

At the final study visit we administered measures drawn from the Add Health.[28] Attitudes and motivations regarding contraceptive use were measured using 7 items ($\alpha = 0.85$). Higher scores (5-point scale) indicated more favorable attitudes aligned with higher motivation to use birth control. We measured contraceptive self-efficacy with 3 items that assessed confidence in choosing, obtaining, and using contraceptives ($\alpha = 0.79$). Higher scores (5-point scale) indicated higher self-efficacy. Contraceptive use: We assessed use at last sex and over the previous 6 months among sexually active participants. Pregnancy: Participants who reported having vaginal sex were asked whether they had been pregnant (females) or gotten someone pregnant (males). Access to reproductive health services: Access measures assessed use of clinic-based services and barriers. Pubertal developmental stage: Pubertal development, measured with the Self-Rating Scale for Pubertal Development,[29] was considered a potential confounder given its known relationship with development of romantic behaviors. Participant's sex was examined as an effect modifier.

Statistical Analysis

We evaluated distributions of categorical and continuous measures. We depicted the initiation of sexual activity using a Kaplan-Meier curve, estimating age-specific proportions with 95% confidence intervals, plotted separately for males and females. The Kaplan-Meier curve was estimated using all available data from the cohort. We assessed differences in estimated curves by participant sex using the log-rank test. Subsequent analyses included the 558 participants (93.2% of cohort) completing the 24-month visit or reporting vaginal sex at previous visits, as sexual initiation could otherwise not be confirmed for those lost to follow up. We used a Poisson model with robust standard errors to evaluate the associations between baseline neighborhood social environment exposures and early sexual initiation. As a sensitivity analysis, we also estimated all models excluding the 17 youth who, at study enrollment, reported having initiated sex. All models controlled for pubertal developmental stage, age at enrollment, and recruitment school (fixed effect) to account for the clustered nature of the data. We tested for differences in contraceptive attitudinal and self-efficacy measures between those who initiated sex early, those initiating at age 15 or older, and those who were not yet sexually active using ANOVA (for summary scores) and χ^2 tests (for proportion in agreement). We compared contraceptive method use between those who initiated sex early and at age 15 or older using χ^2 tests. We examined contraceptive use, attitudes and self-efficacy by participant sex. All analyses were performed using Stata version 15.0 (StataCorp, College Station, TX), with P values $<.05$ considered significant.

RESULTS

Most participants (96%) were aged 13 (70%) or 14 (26%) years at enrollment (range 12–15 years) and 94% identified as Latinx. Sociodemographic characteristics are presented in Table 2.

Sexual Initiation and Social Environment

Over the study period, 14% ($N = 84$; 95% CI, 12–17) reported initiating vaginal sex before age 15. Figure 1 presents the Kaplan-Meier estimates for sexual initiation adjusted for age, with separate curves by sex. Males were more likely to have had sex by age 15 (20% vs 9% of females; $P = .003$), maintaining a consistently higher level of sexual initiation through age 16. An additional 47 initiated sex at age 15 or older. At enrollment, 81% indicated they were sexually attracted to individuals of the opposite sex, 0.5% to individuals of the same sex, 6% to both males and females, and 13% were not attracted to anyone yet, a proportion that diminished to 4% at 2 years follow up.

Distributions of baseline neighborhood social environment measures are presented in Fig 2. On a scale of 1 to 4 (4 = high cohesion), the mean neighborhood social cohesion score was 2.7 (SD, 0.5). The majority of youth agreed that people in their neighborhood

TABLE 2 Baseline Sociodemographic Characteristics of Participants, *A Crecer*: Salinas Teen Health Study, 2015 to 2019

Characteristic	Percent or Median, $N = 599$
Median age, y (interquartile range)	13 (13–14)
Female	53
Hispanic	94
Mexican origin	89
Immigrant generation	
1st: Born outside the United States	12
2nd: US born/immigrant parents	70
3rd: Both parents and youth US born	16
US born; generation unknown	2
Born in Salinas, California	74
Living with	
Both parents	75
Mother only	22
Other	3
Has contact with mother	99
Has contact with father	91
Median household size (range)	5 (2–15)
Crowded housing conditions	61
Mother's education	
Less than high school	42
High school or GED	30
More than high school	25
Unknown	3
Food insecurity (hunger) in past 6 mo	8
Receipt of government assistance in past 6 mo[a]	53
At least 1 parent works in agriculture	49
At least 1 parent moves for work during the year	15

GED, general equivalency diploma.
[a] Includes Medi-Cal, unemployment benefits, food stamps.

are "willing to help each other" (76%), "get along with each other" (76%), and "can be trusted" (62%). In general, school connectedness was high (mean score of 3.3 out of 4 [SD 0.4]). At enrollment, about one-quarter (27%) of youth reported experiencing discrimination in the past 6 months, with a mean of 3 events in the past 6 months (SD 3); 11% experienced discrimination in multiple settings. Experiences were most commonly at school (10%), on the street (9%), or while receiving medical care (7%). Across the sample, adolescents witnessed 4.9 neighborhood disorder events in the past year (SD, 2.9;, range 0–11). Nearly all (96%) had experienced at least 1 event; most common were "I saw cars speeding or driving dangerously on my street" (69%), "I heard gunshots near my home" (62%), and "there was a shooting near my home" (56%). One in five adolescents (21%) reported gang exposure through their social network.

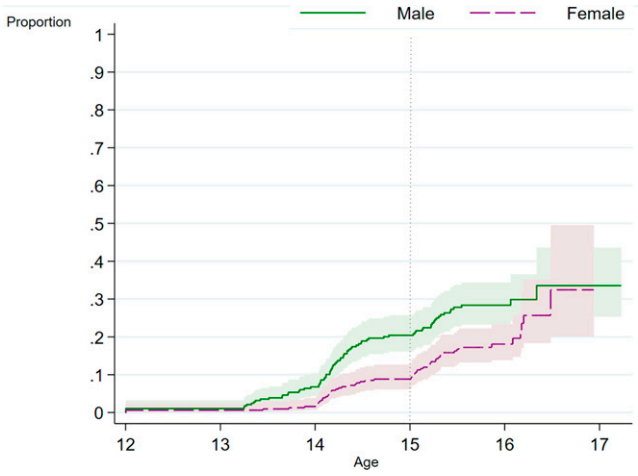

FIGURE 1
Kaplan-Meier plot depicting the probability of sexual initiation during the transition between early and middle adolescence, with 95% confidence bands. Youth enrolled during eighth grade, ages 13 to 14, and followed for 2 years. The dotted line demarks the proportion who initiated sex early, before age 15. $N = 599$.

The associations between neighborhood social environment and early sexual initiation are presented in Table 3. Among the two protective factors considered, greater school connectedness was associated with lower risk of early sexual initiation (RR, 0.45; 95% CI, 0.29–0.70, $P < .001$). Social cohesion had a suggested protective relationship with early sexual initiation, although results were inconclusive (RR, 0.72; 95% CI, 0.49–1.06; $P = .09$). Experiencing more discrimination events was associated with higher risk of early sexual initiation, with an increasing negative effect with increased numbers of events experienced (1–2 events RR, 1.67; 95% CI, 1.09–2.55; 3+ events RR, 2.23; 95% CI, 1.07–4.64; $P < .05$). Neighborhood disorder was also associated with elevated risk of early sexual initiation; for each additional event experienced, the risk of early sexual initiation was estimated to increase by 13% (RR, 1.13; 95% CI, 1.05–1.21; $P = .001$). Those who reported gang exposure through their social networks had a twofold increased risk of initiating sex

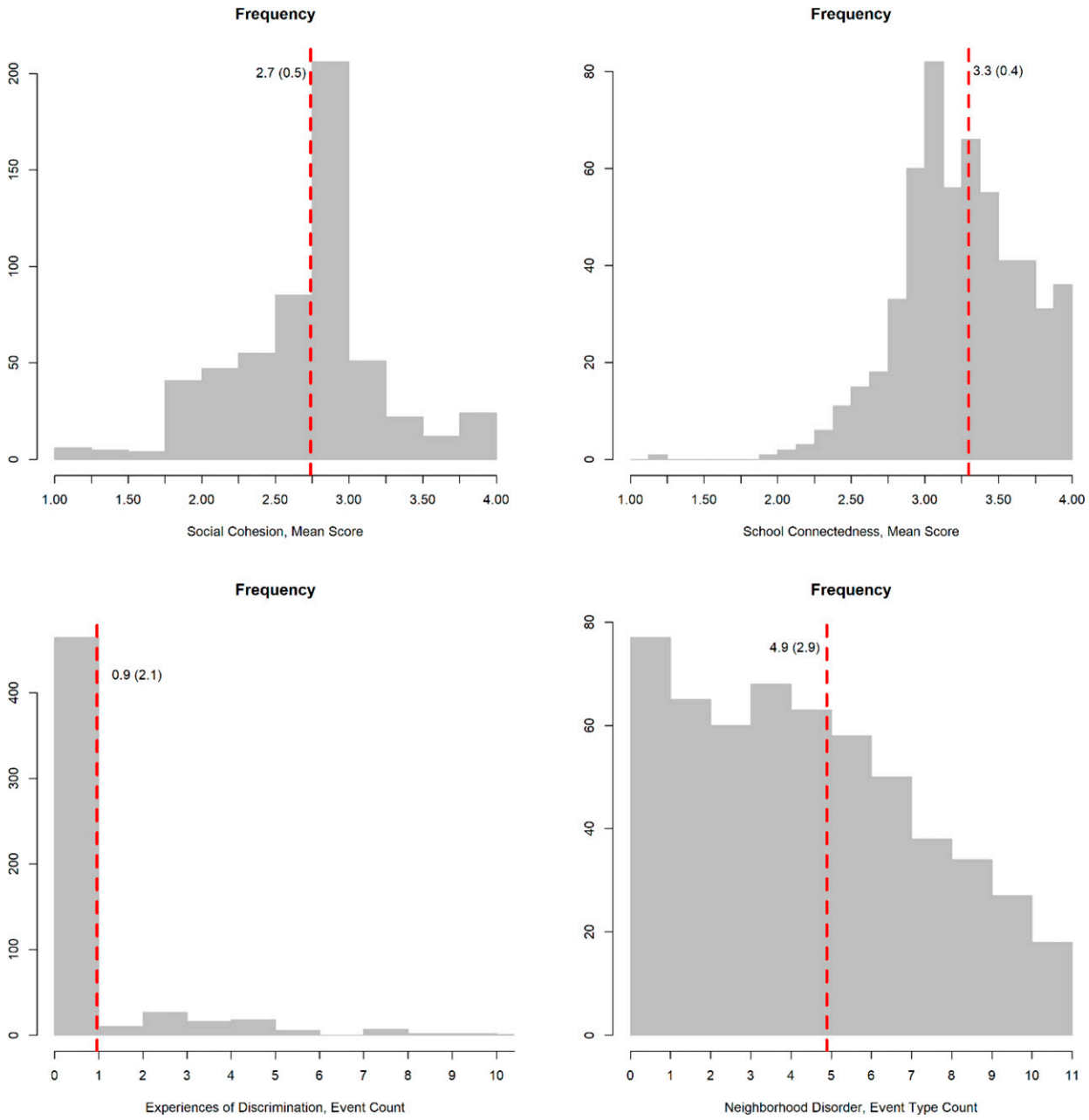

FIGURE 2

Distributions of social environment measures assessed at enrollment. *A Crecer*: The Salinas Teen Health Study ($N = 558$). Red hashed lines indicate the mean with SD.

before age 15 (RR,2.18; 95% CI, 1.46–3.26; $P < .001$).

Contraception, Pregnancy, and Health Services

Contraceptive attitudes differed by timing of sexual initiation (Table 4). More youth who initiated sex before age 15 agreed that birth control is "too much of a hassle to use" (34%), "takes too much planning ahead of time" (43%), and is "too expensive" (42%). Birth control self-efficacy was slightly lower among those who had not yet had sex.

Among those who reported having vaginal sex, 76% reported using a method to avoid pregnancy or STIs the last time they had sex (Table 4). The most common methods were condoms (68%) and oral contraceptives (24%). Almost half (47%, $n = 62$) reported not using a contraceptive method during sex in at least 1 follow-up period, somewhat more common for

TABLE 3 Estimating the Influence of Each Social Environment Measure on Early Sexual Initiation Before Age 15

Baseline Exposures $N = 558$	Adj RR[a]	95% CI
Neighborhood social cohesion, mean score range 1–4	0.71	0.48–1.04
School connectedness, mean score range 1–4	0.44***	0.29–0.69
Experiences of discrimination		
None	Ref	—
Moderate 1–2	1.67*	1.09–2.55
High 3+	2.23*	1.07–4.64
Neighborhood disorder events range 0–11	1.13***	1.05–1.21
Gang exposure through social networks[b]	2.23***	1.49–3.33

Adj RR, adjusted relative risk; Ref, reference group; —, not calculated for reference group.
[a] Adjusted relative risk estimated using a separate Poisson regression model with robust standard errors for each measure. All models adjusted for pubertal developmental stage, age at enrollment, and recruitment school.
[b] Social network gang exposure was defined based on participant report that at least some of their close friends or the people they spend time with now were in or affiliated with a gang.
*$P \leq .05$.
**$P \leq .01$.
***$P \leq .001$.

females than males (56% vs 41%, $P = .08$). Few participants ($n = 16$) reported becoming pregnant or getting someone pregnant: 6 females and 10 males; however, this comprised 12% of the teens who reported vaginal sex. Most pregnancies ($n = 14$) occurred at age 15.

Seven percent ($N = 37$) reported ever visiting a clinic for sexual health services; 103 (18%) said they wanted sexual health services but did not go to a clinic. One-third (37%) of youth who were sexually active said there was a time they wanted to seek sexual health services but did not go. The main reasons cited included: "embarrassed" (25%), "worried someone would find out" (24%), "no time or too busy" (21%), or "did not know where to go" (12%).

DISCUSSION

Social environment factors underlie many health disparities experienced by minority populations in the United States. This prospective study of sexual health during the transition between early and middle adolescence identified multiple dimensions of neighborhood social dynamics, both protective and risk factors, that were associated with early sexual initiation, which has been linked in later adolescence with heightened risk for unintended pregnancy and STIs.[9–11] Identifying strategies to mitigate social environment risks and strengthen protective neighborhood social dynamics is necessary to reduce disparities in sexual health outcomes for Latinx adolescents and emerging adults. Most sexual health research and prevention approaches address individual level risk factors, yet widespread recognition of social determinants, the structural and social influences on health, is needed.[30–32] The relative salience of social determinants on sexual health in an agricultural community shaped by immigration is largely unexamined. This study, therefore, addresses gaps in understanding aspects of social environments that appear influential to sexual health during the transition between early and middle adolescence.

Reported initiation of vaginal intercourse over time in the *A Crecer* cohort yielded estimates aligned with national data. Twenty-three percent reported vaginal intercourse by the 2-year exit visit (mean age 15), a proportion comparable to age 16 NSFG estimates.[33] Thus, while youth commonly experienced social environments tied to health inequities, the level of sexual initiation in early adolescence was quite similar to national estimates. Although the majority had not yet initiated vaginal intercourse, among those who had, contraceptive use was inconsistent and use of reproductive health care services was limited, with pregnancy data underscoring these gaps. The availability of fewer adolescent-friendly services, even in the urban center of this agricultural setting, and cultural norms regarding teenage sexual behavior may contribute to access barriers and attitudes that limit contraceptive use. Findings, then, underscore the importance of a targeted approach to ensure access to and promote use of contraceptives and condoms among sexually active adolescents. Furthermore, because of disproportionately high rates of unintended pregnancy and STIs among Latinx youth in later adolescence, findings offer an opportunity to intervene to address social environment risks and strengthen protective factors to shift sexual health trajectories through adolescence.

Recent Add Health data highlight the importance of contraceptive attitudes in adolescence to the use of effective contraceptives and consistent use in adulthood.[34] Despite no differences in contraceptive self-efficacy comparing those who had initiated sex and those not yet sexually active in *A Crecer*, self-efficacy was relatively low overall. In addition to being tied to a higher use of contraceptives by females, higher contraceptive self-efficacy among adolescent males is associated with decreased odds of becoming an adolescent father and with being a nonresident father in adulthood.[35]

TABLE 4 Contraceptive Attitudes and Self-efficacy by Sexual Initiation Status at 2-Year Follow-up; Contraceptive Use Among Sexually Active Over 2 Years of Follow-up

	Before Age 15, $N = 84$,[a] %	Vaginal Sex Debut at Age ≥15, $N = 47$, %	Never Had Sex, $N = 427$, %	Total, $N = 558$, %
Birth control attitudes 7-items, 1–5: strongly agree				
Mean, median; SD*	3.24, 3.00; 0.9	3.55, 3.57; 1.0	3.46, 3.29; 0.7	3.43, 3.29; 0.8
In general, birth control is too much of a hassle to use**	34	17	17	20
In general, birth control is too expensive to buy***	42	30	20	24
It takes too much planning ahead of time to have birth control on hand***	43	28	17	22
Using birth control is morally wrong*	15	6	6	8
Birth control self-efficacy 3-items, 1–6: very sure				
Mean, median; SD	4.61, 4.67; 1.2	4.70, 5.00; 1.2	4.33, 4.33; 1.4	4.40, 4.67; 1.3
High self-efficacy	48	51	37	39
You could plan ahead to have some form of birth control available	59	55	47	50
..You could stop yourself and use birth control once you were in the heat of the moment**	56	55	40	43
"I never want to use birth control"[b]	8	4	11	10
Contraceptive use				
Contraception use at last sex[c]	79	70	NA	76
Condoms	71	62	—	68
Birth control pills	25	23	—	24
Withdrawl/pulling out	12	11	—	12
Ever reported having unprotected sex	48	47	NA	47
Ever used emergency contraception	37	23	NA	32

—, contraceptive use assessments not applicable to those who reported never having had sex.

[a] Five participants did not complete the 2-year follow-up and are missing responses to the birth control attitudes and self-efficacy ($N = 79$).

[b] Response to at least 1 of 3 self-efficacy items.

[c] Could select more than 1 method.

*$P < .05$.

**$P \leq .01$.

***$P \leq .001$.

Identifying social environment assets, such as strong school connectedness, is critical to informing interventions that strengthen communities to support youth in overcoming socioeconomic and other structural adversity. While in this study, stronger perceived neighborhood social cohesion offered a protective association with early sexual intercourse; this relationship did not reach statistical significance ($P = .09$). School environments, though distinct from general neighborhood contexts, constitute an important neighborhood-based institution for adolescents. That school connectedness was protective against early sexual initiation aligns with past research,[25] underscoring the importance of schools in cultivating connections with youth. Connectedness can be promoted through school environments that foster supportive peer and adult relationships, strengthen adolescent and family participation in decision-making, and facilitate inclusive and meaningful opportunities for engagement alongside safe physical environments.[36] Strong ties to protective neighborhood-based

social institutions, such as schools, stand to buffer structural disadvantage and shape supportive neighborhood environments and social dynamics for adolescents.

The multiple adverse social dynamics associated in this study with early initiation of sexual intercourse point to the importance of social environments in early adolescent sexual behavior and the need to identify protective factors that constitute intervention targets to buffer these exposures. Neighborhoods characterized by high levels of concentrated socioeconomic disadvantage have been shown to contribute to multiple adolescent risk behaviors, including youth violence, substance use, and early initiation of sexual activity.[37–40] Likewise, gang exposure through social networks, including partners, has been tied to teen and unintended pregnancy.[41] This structural disadvantage is theorized as contributing to neighborhood social disorder, which in turn may disrupt protective social ties and opportunities to establish positive social norms that promote well-being and facilitate positive health outcomes in adolescence.[24,42–45]

Several limitations should be noted. First, while the prospective assessment of sexual initiation constitutes a strength, given that we enrolled eighth graders, early onset of vaginal intercourse (less than age 15) could occur for most adolescents within the first year of follow up. Thus, while we recognize the value of exploring time varying exposures and changes in exposures precipitating initiation of sexual behavior, we were limited to exposures measured at baseline. Second, self-reported sexual activity and social environment exposures may be subject to social desirability bias, despite use of ACASI. Reports of social environment risks were sufficiently high to suggest normalization and/or comfort in reporting. Third, generalizability is limited with a single site study. Nonetheless, adolescents residing in agriculture-based communities shaped by immigration constitute an under-represented, and demographically important, population in research. Though our sample is not population-based, comparison of our sample characteristics with school district data, the school-based California Healthy Kids Survey, and NSFG estimates of sexual initiation in adolescence suggests comparability across key sociodemographic and behavioral factors.

CONCLUSIONS

This prospective study of sexual health during the transition between early and middle adolescence identified multiple dimensions of neighborhood social dynamics, both protective and risk factors, that were associated with early sexual initiation among Latinx adolescents. Although the majority had not yet initiated vaginal intercourse, among those who had, contraceptive use was inconsistent and use of reproductive health care services was limited, underscoring heightened risk for unintended pregnancy and STIs. Most research on social environment effects on sexual health that does exist, particularly neighborhood social dynamics, has been conducted in urban settings in the US, yet agriculture based regions experience health inequities shaped by distinct social determinants. Findings underscore opportunities to promote early adolescent sexual health through strengthening supportive and safe neighborhood social environments with the promise of addressing disparities in unintended pregnancy and STI rates for Latinx youth in later adolescence.

ABBREVIATIONS

ACASI: Audio computer-assisted self-interviewing
ANOVA: Analysis of variance
NSFG: National Survey of Family Growth
STI: Sexually transmitted infection

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

FUNDING: The Eunice Kennedy Shriver National Institute of Child Health and Human Development and the Office of Behavioral and Social Sciences Research, National Institutes of Health (R01HD075787 and K23HD093839).

CONFLICT OF INTEREST DISCLOSURES: The authors have no conflicts of interest or financial interests relevant to this article to disclose.

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