# Contraceptive Decision-Making and Use Among Latina Adolescents Aged 18-19 in the United States

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Abstract

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Contraceptives offer individuals who do not want to become pregnant one form of reproductive autonomy. They are safe and effective when used correctly, and in the case of long-acting reversible contraception (LARC), are associated with very low failure rates, user independence, and convenience. For adolescents, who are beginning to engage in sexual activity, and are also likely to want to prevent pregnancy, contraceptives provide a mechanism to do so. In the United States, where the adolescent birth rate is still significantly higher than other industrialized nations, there is particular interest by policymakers and reproductive health program developers to better understand how, when, and why adolescents use contraceptives. However, U.S. history is fraught with coercive, racist, and discriminatory practices and policies targeted at marginalized groups, and this has long-lasting ramifications on individuals' contraceptive use perceptions and behaviors.

Nationally representative, cross-sectional survey data, from sources such as the National Survey of Family Growth and the Youth Risk Behavior Surveillance System, provide an initial assessment of U.S. adolescent contraceptive use. Data from these surveys indicate that U.S.

Hispanic adolescents are less likely to use effective contraception than their non-Hispanic white counterparts.[1] Furthermore, they experience disproportionately higher rates of unintended pregnancy. However, beyond these data, very little is known about U.S. Latina adolescent contraceptive use patterns and decision-making. This dissertation aims to address this gap by: 1) investigating Latina adolescents' consistency in non-barrier contraceptive method use and factors associated with method non-use, switching, and consistency; 2) assessing whether Latina adolescents using different types of non-barrier contraceptive methods, specifically LARC (implants and intrauterine devices), are more likely to engage in condomless sex and less likely to use dual methods of protection (combined use of non-barrier contraception and condoms); and 3) explore the influential factors that may interact in the Latina adolescent's decision-making process around contraception use.

Previous research has indicated that U.S. Latinas of any age are less likely to use contraception, may have different method preferences, and may be inclined to earlier discontinuation, but we are unaware of any longitudinal investigation of Latina adolescent contraceptive use. Our research fills this gap by exploring the temporal dynamics of and factors associated with Latina adolescent contraceptive use over a nine-month period within a cohort of individuals who were trying to avoid pregnancy. We found that those using intrauterine devices (IUD) were most likely to be consistently using the same method nine months later than users of other non-barrier methods, and factors associated with this included being older, having never been pregnant, having higher contraceptive knowledge, and having a greater perceived risk of

[1] The language used in this document to refer to the ethnicity of the population to which this research pertains is purposeful. While I have chosen to describe the individuals from whom the data in this dissertation were collected as "Latinas", the term is not always appropriate when describing data and findings from other research that has used the term "Hispanic". My rationale for referring to the individuals in this work as "Latina" is informed both by the way in which the individuals in my studies self-identified as well as guidance from colleagues who identify with the same ethnicity and have indicated that this is the preferred term for this group. Furthermore, all of the individuals in the datasets which I used self-identified as female, so the gendered version of this attribute is appropriate. To be respectful to both the group of individuals upon which my research is based, and accurately describe the research of others, I use either "Latina" or "Hispanic" in a thoughtful way to describe individuals of the same ethnicity, depending on what is being discussed and what was used in the original research.

pregnancy. This suggests that the IUD may offer greater contraceptive stability for Latina adolescents who do not want to become pregnant.

While non-barrier contraception may offer protection from unintended pregnancy, contemporary literature among women of any reproductive age and predominantly non-Latina white adolescents has reported that users of specific contraceptive methods, notably LARC, appear less likely to use dual protection (combined use of non-barrier contraception and condoms) than those using short-acting hormonal methods. However, there is also some conflicting research indicating that LARC use may not lead to diminished perceptions of STI risk or actual condom use. Alongside this, there has been a recent notable rise in sexually transmitted infections (STIs) among U.S. adolescents, with Latina adolescents experiencing STI rates up to three times greater than their non-Latina white counterparts. The higher STI rates, mixed findings on this topic, and data indicating that Latina adolescents use contraceptives and condoms differently than their counterparts in other racial and ethnic groups, highlight important questions to ask about Latinas' use of dual protection. Our research found that Latina adolescents using any type of non-barrier contraception had higher rates of recent condomless sex than non-users, and that among those using non-barrier contraception, LARC or injection users had significantly lower rates of dual protection use. Taken together, this suggests that Latina adolescents using non-barrier contraception, particularly LARC, may be at greater risk for STIs (although, this needs to be investigated in future research) and emphasizes the importance of including information on dual protection in contraceptive counseling and reproductive health interventions.

Qualitative research methods provide us with an opportunity to gain deeper insight and a more nuanced understanding of factors that may influence Latina adolescents' contraceptive choices. We leveraged interview data collected from 37 Latina adolescents to explore how interpersonal-

and individual-level factors may interact in the contraceptive decision-making process. Our analysis sheds light on the interconnected roles that future ambitions, partner influence, pregnancy intentions, method consistency, fear, and expected familial responses to pregnancy play in this process.

The collective findings in this dissertation offer enhanced knowledge on how, when, and why U.S. Latina adolescents use non-barrier contraception, which can be pragmatically applied in patient-centered contraceptive counseling and reproductive health programs. This work aims to motivate recognition of the potentially differential contraceptive use behaviors and priorities of U.S. Latina adolescents and highlight the need for reproductive justice-informed approaches that are more responsive and attentive to their individual needs and desires.

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This work would not have been possible without the Latina adolescents who agreed to participate in this research and share their experiences and stories with us. I am very grateful for having the opportunity to try and better understand what you are telling us.

Finally, I could not have completed this milestone without the love and endless reinforcement of my family and friends. To my children, Madeleine and Edward, who provide such incredible joy and laughter; you offered me necessary breaks from the long hours of work and were understanding when I needed to shift my attention to my research. To my sisters, Annie and Mary, who supplied shoulders to cry on, inspiration when I needed it most, and auntie adventures so I felt less guilty about being unavailable at times as a mother. To my friends, Nina, Uma, Charlene, and Emily, who rooted for me the whole time, can always be counted on for comic relief, and are true examples of women and mothers making the world a better place. To my husband, Robert, who motivated me to pursue this incredible feat because of his own quiet perseverance and determination and supported me in this endeavor. Lastly, to my mother, who has constantly provided childcare, meals, housekeeping, love, compassion, understanding, and encouragement throughout the past six years. This is equally a victory for her and my dad, who emboldened me to reach for the stars and pursue every dream imagined.

## DEDICATION

*To my mother, who has been an extraordinary example of humble strength and unconditional love, inspiring me to reach for every conceivable dream and supporting me in that journey.*

*-and –*

*To my children, who are such incredible sources of joy and wonder and motivate me to help build a better world for them to live in.*

# CHAPTER 1: INTRODUCTION

Despite historic declines in adolescent birth rates (births to females aged 15-19), the U.S. is still estimated to have one of the highest birth rates of any industrialized country (15.4 per 1000 females aged 15-19) [1–3] and it is estimated that 75% of those pregnancies are unintended.[4] When disaggregated by racial and ethnic subgroups, U.S. Hispanic adolescents experience the third highest rate (23.5 per 1000 females aged 15-19) after American Indian/Alaska Natives and Black adolescents, and the literature indicates that Hispanic adolescents disproportionately experience unintended pregnancy as compared to their non-Hispanic white counterparts.[5] Although the validity and representativeness of the unintended pregnancy measure has been called into question,[6,7] and there are significant efforts to improve our understanding of and better assess pregnancy intentions, [8–11] it still represents the best measure at the present moment to estimate pregnancies that are not wanted at that time or ever. Unintended pregnancy has been associated with greater risk for adverse pregnancy outcomes,[12,13] and recent research suggests that unwanted pregnancy places mothers at greater risk for serious adverse health outcomes, poor maternal bonding, and economic hardship for both the mother and her children.[14–16]

Determining what outcomes may be attributed to adolescent pregnancy is extremely difficult because of the influence of a number of confounding factors, in particular socioeconomic status. It is methodologically challenging to design a study that can assess whether causes that may have led to the adolescent pregnancy (i.e., lower income level, less education, among others) simply continue post-pregnancy, or whether the early age at which the pregnancy itself occurred is the primary cause of subsequent outcomes. However, some literature indicates that adolescent mothers appear less likely to receive a high school degree or GED and pursue postsecondary education, and that their children may have a greater likelihood of lower cognitive and academic outcomes and be at an increased risk of being abused or neglected.[17,18] Contradictory literature has found that the negative effects of adolescent childbearing may not

be equally experienced by all racial and ethnic groups because of the social and economic disadvantage they already encounter.[19]

Although research on adolescent and unintended pregnancy is an evolving area of inquiry, it is clear that non-barrier contraceptives offer individuals who wish to prevent pregnancy a highly safe and efficacious mechanism to do so and serve as one form of reproductive autonomy. Among available contraceptive options, long-acting reversible contraception (LARC) methods (implants and intrauterine devices [IUDs]) have the smallest probability of contraceptive failure, and are 20 times more effective at preventing unintended pregnancy than oral contraceptive pills.[20–22] LARC is also more user-independent, long-lasting, and more convenient.[23] Both the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists have endorsed LARC methods as highly effective and safe for adolescents.[24,25]

However, LARC is also associated with a controversial history of coercive, racist, and biased reproductive health practices, which have been used to overly promote, require, or force LARC upon marginalized groups, particularly women of color. [26–29] As an example, just two days after Norplant was approved by the FDA in 1990, an editorial from the Philadelphia Inquirer suggested that the device could be used as a way to reduce the birth rate of black women, thereby decreasing the number of black children living in poverty.[30] This sparked a heated debate about the potential to coerce women into using the method through public assistance incentives. Between 1991 and 1994, a number of states introduced legislation that would incentivize or mandate the use of Norplant. There is also repeated contemporary evidence of judges requiring women who have committed crimes to get the implant.[31] Any exploration or discussion of LARC as a contraceptive option for Latina individuals, as is the case with this dissertation, should be carefully balanced and acknowledge this reality.[32–34]

Although the disproportionate rate of unintended pregnancy experienced by U.S. Latina adolescents is often presented as a public health “problem”, very little is yet known about how, when, and why Latina adolescents use non-barrier contraceptives, which are data that could inform the development of reproductive health practices and programs better tailored to their individual needs. Limited data on Latina adolescent contraceptive use are available from nationally representative, cross-sectional surveys such as the National Survey of Family Growth (NSFG) and the Youth Risk Behavior Survey (YRBS), which cannot assess individual-level changes over time, as well as a finite number of longitudinal studies.[35–42] The literature indicates that U.S. Hispanic individuals of any age are less likely to use contraception,[43] may have different method preferences,[44,45] and may be inclined to earlier discontinuation.[46] Additionally, Hispanic adolescents appear more likely to use less effective methods than their non-Hispanic white peers.[35,47,48]

To address these gaps in knowledge, we leveraged longitudinal data collected from >1500 Latina adolescents who participated in a recently conducted randomized controlled trial assessing the efficacy of a sexual and reproductive health video intervention. Using these data, we investigated two key research questions: 1) Which non-barrier contraceptive methods are Latina adolescents most likely to use consistently and what factors are associated with consistency, method switching, and non-use?; and 2) Are Latina adolescents who use particular non-barrier contraceptive methods more likely to engage in future condomless sex and less likely to use dual methods of protection? We also made use of rich, qualitative data collected from 37 Latina adolescents who shared their contraceptive use history, stories, and pregnancy intentions with us to explore one final research question: 3) Which factors interact to influence Latina adolescent contraceptive decision-making?

## Consistency of Non-Barrier Contraceptive Method Use Among Latina Adolescents (Chapter 2)

***Which non-barrier contraceptive methods are Latina adolescents most likely to use consistently and what factors are associated with consistency, method switching, and non-use?***

YRBS data from 2020 indicate that 12.8% of U.S. Hispanic high school students reported not using any pregnancy prevention method, compared to just 6.8% of non-Hispanic white students. Withdrawal was more frequently used by Hispanic students than non-Hispanic white students (13.1% vs. 7.7%), and when using a method, Hispanic students more often relied upon less efficacious options, specifically condoms.[35] Similar findings have also been reported from NSFG data, which include a slightly older population (individuals aged 18-25 years).[36,42] As an example, one study found that Hispanic adolescents appeared to have about half the odds of using effective contraception (non-barrier hormonal methods, copper IUD, and sterilization) at last sexual intercourse as compared to their non-Hispanic white counterparts.[48] While most research points to a propensity for Hispanic adolescents to rely upon less effective methods, conflicting evidence has been reported. At least one study has suggested that Hispanic adolescents may be more likely to choose a highly effective method than their non-Hispanic white peers. However, this is based on a very small sample of individuals (n=143) and produced an unstable estimate.[47] Taken together, the limited data and mixed results highlight the need to better understand contraceptive method use differences that may exist for Latina adolescents to inform reproductive health practices better tailored to their needs and desires.

Building upon this, if Latina adolescents make different contraceptive method choices, this prompts us to ask how method continuation may also vary. Contraceptive continuation studies to-date have explored this question among cohorts of parous adolescents,[49,50] predominantly

non-Hispanic black or non-Hispanic white adolescents,[38,41,51–57] and Latina individuals of all reproductive ages.[58] Findings consistently indicate that individuals who use any LARC method (implant or IUD) are significantly more likely to continue method use than those using other hormonal methods. However, some research has suggested that Hispanic individuals may be inclined towards earlier method discontinuation than their non-Hispanic white counterparts.[46]

We are not aware of any research that has yet explored long-term contraceptive use in a cohort of Latina adolescents. In Chapter 2, we use longitudinal data collected from >1,500 Latina adolescents to describe use of non-barrier contraception over a nine-month period, assess consistency of method use, and determine factors associated with method non-use, switching, and consistency. Our results indicate that over a nine-month period, Latina adolescents using IUDs were more likely to be consistent users of their method as compared to users of all other non-barrier methods combined (including the implant). Furthermore, we did not find implant users to experience rates of consistency greater than those using other non-barrier methods. These findings suggest that IUDs may offer the greatest contraceptive stability for Latina adolescents who wish to prevent pregnancy.

**Combined Condom and Non-Barrier Contraceptive Method Use Among Latina Adolescents (Chapter 3)**

***Are Latina adolescents who use particular non-barrier contraceptive methods more likely to engage in future condomless sex and less likely to use dual methods of protection?***

Use of dual methods of protection – specifically, non-barrier contraceptive use for prevention of undesired pregnancy and barrier contraceptive use for prevention of HIV and other sexually transmitted infections (STIs) – is recommended as a safe sex practice for adolescents.[59] However, cross-sectional data indicate that less than a quarter of U.S. adolescents report using

dual methods at last sex.[35,36] This appears to potentially differ by race and ethnicity with recent estimates showing that between 12-29% of non-Hispanic white female teens report using dual protection during last sex compared to only 4-8% of Hispanic female teens.[35,36] Furthermore, STI rates are rising among U.S. adolescents, with Hispanic adolescents at a disproportionately greater risk.[60]

Coinciding with this is increasing use of LARC by U.S. adolescents,[61] along with growing evidence that LARC use may be associated with a reduced likelihood of condom use.[62–68] However, there is only one study that has investigated this in a cohort of Latina adolescents.[69] Moreover, there is recent diverging data, which has shown no difference in the uptake of STI testing between adolescents using LARC and non-LARC methods,[70] and equivalent dual method use by adolescents exposed or not exposed to a LARC promotion intervention.[71] These data suggest that, in certain scenarios, adolescents who choose LARC methods may not necessarily have a diminished perception of their risk for STIs or reduction in condom use. In Chapter 3, we explore this topic using the same longitudinal dataset employed for Chapter 2. We assess the associations between use of specific non-barrier contraceptive methods with condomless vaginal sex and use of dual methods of protection. Our study suggests that Latina adolescents using any non-barrier contraceptive method may be more likely to have condomless sex than those not using a method. Yet, among those who are using a method, we found users of highly effective methods (IUD, implant, and injection) to be less likely to use dual protection than users of short-acting hormonal methods (pill, patch, and ring). These results underscore the importance of providing information on dual protection use to prevent STIs in reproductive health counseling and programming, particularly among Latina adolescents selecting highly effective methods.

**Competing and Collaborating Factors in the Latina Adolescent Contraceptive Decision-Making Process (Chapter 4)**

***Which factors interact to influence Latina adolescent contraceptive decision-making?***

While the literature indicates that Latina adolescents are less likely to use effective contraceptive methods,[35,36,42] factors influencing their contraceptive choices are not well understood. Research has tended to focus on exploring factors independently and has not investigated the ways in which they may interact. Parents, partners, peers, and health care providers have been identified as interpersonal influences that may sway Latina adolescents' contraceptive decisions.[72–79] Additionally, individual-level characteristics such as pregnancy intentions, acculturation level, contraceptive knowledge, previous childbearing experiences, and perceptions of or a personal history with contraceptive side effects may play a role in Latina adolescents' contraceptive selections.[74,80–88] In response to the multiple calls for research that more robustly examines the complexities and nuances of how adolescents make contraceptive decisions,[89,90] we leveraged interview data collected from 37 Latina adolescents. In Chapter 4 we qualitatively examine ways in which influential factors previously cited in the literature may interact in the Latina adolescent contraceptive decision-making process. We describe the ways in which future ambitions, partner influence, pregnancy intentions, method consistency, fear of methods, and expected familiar response to pregnancy shape these decisions and suggest ways to be responsive to these factors in reproductive health interventions and patient-centered contraceptive counseling.

## Summary

This dissertation explores Latina adolescents' contraceptive use patterns over time and the interconnected factors that shape and influence their contraceptive decision-making. Our work contributes significantly to the literature investigating how contraceptive use behaviors may differ for Latina adolescents, presents supporting evidence suggesting reasons for why this may be, and highlights ways in which reproductive health interventions and patient-centered contraceptive counseling can be tailored to better meet their individual needs and desires. The collective findings in this work emphasize the need for reproductive justice-informed approaches that support the varied and unique contraceptive priorities of Latina adolescents who wish to prevent pregnancy, as well as those who would welcome childbearing.

# CHAPTER 2: NON-BARRIER CONTRACEPTIVE USE PATTERNS AMONG LATINA ADOLESCENTS ATTENDING CALIFORNIA REPRODUCTIVE HEALTH CENTERS: A LONGITUDINAL STUDY

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# Non-Barrier Contraceptive Use Patterns Among Latina Adolescents Attending California Reproductive Health Centers: A Longitudinal Study

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## ABSTRACT

**Objective:** To describe use of non-barrier contraceptives over a nine-month period, consistency in method use, and determine factors associated with method non-use, switching, and consistency among Latina adolescents attending California sexual and reproductive health (SRH) centers.

**Study Design:** We conducted a cohort study using data self-reported at baseline, and three- and nine-months post-baseline. The analysis included 1162 sexually active adolescents aged 18-19 who self-identified as female and Latina, indicated that they were not currently pregnant or trying to become pregnant, and who attended California SRH centers between June 2016-June 2020. We used binomial generalized multivariable linear models with a log link to assess the likelihood of non-barrier method consistency, switching, and non-use.

**Results:** At baseline, 596/1162 (51.3%) of Latina adolescents reported not using any type of non-barrier contraceptive, 453/1162 (39.0%) were using short-acting methods, and 113/1162 (9.7%) were using long-acting methods. Over a nine-month period, 22/33 (66.7%) of those using intrauterine devices (IUD) consistently used the IUD, which was a significantly greater frequency of consistency than individuals who selected other non-barrier methods (270/530 [50.9%], aRR: 1.40; 95% CI: 1.11, 1.77). Implant users had rates of method consistency similar to users of other non-barrier methods (aRR: 1.11; 95% CI: 0.89, 1.38). Factors independently associated with method consistency included being older, having never been pregnant, having greater perceived risk of pregnancy, and greater contraceptive knowledge.

**Conclusion:** Sexually active Latina adolescents not trying to become pregnant at baseline maintained consistent contraceptive use more frequently when using an IUD. Using a patient-centered approach, contraceptive counseling for Latina adolescents can describe the combined efficacy and contraceptive stability offered by IUDs.


**KEYWORDS:** Adolescent; Latina; Long-acting Reversible Contraception; Longitudinal; Intrauterine Devices; Contraception

**IMPLICATIONS:** This study addresses gaps in knowledge about U.S. Latina adolescents' contraceptive use patterns, demonstrating that IUD users, and not implant users, appear more likely to consistently use their method than those using non-LARC methods. Patient-centered contraceptive counseling for Latina adolescents can describe the greater contraceptive stability that IUDs may offer.

## INTRODUCTION

Latina adolescents disproportionately experience unintended pregnancy as compared to their non-Latina white peers.[5] While the representativeness and accuracy of the unintended pregnancy measure is debated,[6,91] it still aims to depict pregnancies that individuals did not want to have at that time or ever, and is the best indicator at the present moment of whether individuals are able to access the contraceptive and abortion services they desire.[6] Furthermore, unwanted pregnancy is associated with greater risk of serious adverse health outcomes for the mother, poor maternal bonding, and economic hardship for both the mother and her children.[14–16] Contraceptives offer individuals safe and effective methods to prevent undesired pregnancy. In particular, long-acting reversible contraception (LARC) is associated with very low failure rates, user independence, convenience,[20–22] and greater cost-effectiveness.[92] For adolescents, the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists have endorsed LARC as highly effective and safe,[24,25] so they serve as compelling methods for adolescents who want to prevent pregnancy. However, LARC is also associated with a history of coercive and biased reproductive health practices, particularly targeted at women of color,[26,93] and any discussion of them as contraceptive options should be carefully balanced, acknowledging this context and possible lived experiences of individuals.

The limited data that describe contraceptive use by Latina adolescents come predominantly from cross-sectional surveys[35,42,47,80] which are not able to assess individual-level longitudinal changes. The literature indicates that Latina individuals of any age are less likely to use contraception,[43] may have different method preferences,[46,94] and may be inclined to earlier discontinuation.[46] Additionally, Latina adolescents appear more likely to use less effective methods than their non-Latina white peers.[35,47,48] Research has demonstrated that Latina adolescents' contraceptive use may be influenced by both their perceptions of and experiences

with contraceptive method side effects.[87] Additionally, studies indicate that Latinas value and desire reproductive health information-exchange with their providers,[78,79] but they may also have received medically imprecise information from their social network,[74,77] which can influence their contraceptive decisions. However, despite noted racial and ethnic differences, very little is yet known about Latina adolescents' contraceptive use patterns. Thus, the objective of our study was to fill a gap in the understanding of temporal dynamics of contraceptive use by Latina adolescents. This will inform client-centered contraceptive counseling, so that it can be better tailored to meet this population's unique needs.

We capitalized on the availability of longitudinal data from a randomized controlled trial (RCT) that engaged more than 1,500 U.S. Latina older adolescents aged 18-19 years, who represent the adolescent age group most likely to experience unintended pregnancy.[4,95] This research explores this underserved population's contraceptive choices over a nine-month period and assesses the likelihood of and factors associated with non-barrier method consistency, switching, and non-use.

## MATERIALS AND METHODS

### Study Design and Setting

A recently conducted RCT of a sexual and reproductive health (SRH)-focused video intervention collected longitudinal data from a cohort of >1,500 Latina adolescents who self-identified as female and were receiving services at eight Planned Parenthood SRH centers in Central California (NCT#03238313).[96] The study team selected health centers with high numbers of Latina or Black adolescent clients (parent study target populations), clinic staff willing to recruit participants, and proximity to rural or less affluent communities. Enrollment occurred from June 2016-June 2019. Using RCT data, we conducted a prospective cohort study to investigate contraceptive method consistency and factors associated with consistency, switching, and non-

use in Latina adolescents. The parent study protocol was approved by the Sterling Institutional Review Board.

**Study Population**

To be eligible for participation in this study, individuals had to self-identify as female and Latina, be 18- or 19-years old, have visited participating parent study health centers, be deemed appropriate for enrollment by a health center staff member with regards to physical and mental health or capacity, and have reported at all three data collection points that they had engaged in recent vaginal sex (past three months). For these analyses, we excluded individuals who either knew they were pregnant or were trying to get pregnant and/or self-reported that they had not been honest when providing data. Some analyses further restricted the sample to participants who reported non-barrier contraception use at baseline.

**Data Collection**

Data were collected via self-administered questionnaire and completed mostly electronically by participants at baseline, and three- and nine-months post-baseline. Each individual's use of non-barrier contraception was assessed at all time points with the select-one question "Which of the following methods of prescription birth control are you currently using?". Response options were: None, I am not currently using any of these methods; Oral contraceptives; Patch; Ring; Shot/injection; IUD; or Implant.

**Outcome Measures**

We compared baseline to follow-up responses about contraceptive method to assess method consistency. Individuals were categorized as consistent users if they reported using the same non-barrier method at baseline and future time points (i.e., baseline and three-month, or baseline and three-month and nine-month) and inconsistent users if they reported using a

different non-barrier method or no method at future time points. We defined individuals as method switchers if they reported using a non-barrier method during at least one time point but reported using a different or no method during at least one other time point. We operationalized individuals as non-users if they reported at all three time points to be using “None” of the listed non-barrier methods.

**Statistical Analysis**

We assessed baseline differences between those not using non-barrier methods, LARC users, and non-LARC users using ANOVA for continuous variables and the chi-squared test for categorical variables. To visualize Latina respondents’ contraceptive use choices over time, a lasagna plot was constructed.[97,98]

We used binomial generalized linear models (GLM) with a log link to estimate the likelihood of method consistency over three- and nine-month periods. The primary analysis assessed method consistency by: the discrete baseline method selected, comparing users of one method to all other non-barrier method users; and baseline method type, comparing LARC (implant or IUD) to non-LARC users (pill, patch, ring, or injection). For method consistency analyses, we only included individuals who reported using a non-barrier method at baseline.

We determined gravidity *a priori* as an adjustment variable for each model because of potential differential method use between nulligravid and gravid adolescents.[44] Additionally, in each model, we assessed several other baseline factors as potential confounders including age, education, SRH visit frequency in a one-year period, recent condomless sex, number of sex partners in past three months, pregnancy risk perception, contraceptive knowledge, and parent study randomization assignment; we retained any characteristic in the final model that, when individually added, substantially changed the risk ratio (by >10%).

To evaluate the robustness of effect estimates to model specifications, we conducted several sensitivity analyses. We excluded inconsistent observations from adolescents who reported at baseline to be currently using non-barrier contraception, but simultaneously reported that they did not use non-barrier contraception in the past three months (excluded 52/1162 [4.5%]); the baseline questionnaire was completed before seeing a SRH provider so these two circumstances could not co-occur. For only the three-month consistency analysis, we excluded data from adolescents whose three-month questionnaire was completed >1 month after the questionnaire completion target date (excluded 145/1162 [12.5%]). For only the nine-month consistency analysis, we excluded data from adolescents whose three- and nine-month questionnaires were completed >1 month after the target dates (excluded 253/1162 [21.8%]).

Finally, we explored other measured baseline characteristics as predictors of either method non-use, switching, or consistency over the nine-month period. We built separate binomial GLMs with a log link and assessed whether there were any potential confounders that, when individually added, changed the risk ratio by >10%. In the analysis focused on predictors of method consistency, we also adjusted *a priori* for baseline IUD use in each model. All analyses were conducted in Stata 16.1 (Statacorp, U.S).

**RESULTS**

The study included 1162 sexually active Latina adolescents who were not trying to become pregnant at baseline and who provided follow-up data at all three time points. In analyses focused only on individuals who reported using a non-barrier method at baseline, 566 participants were included. Follow-up rates were extremely high, with 1448/1542 (94%) of the original parent study sample providing data at all time points. Baseline characteristics were similar between participants in this study and the larger parent study sample, except for the

percentage reporting condomless sex in the past three months (1211/1541 [78.6%] in parent study; 1012/1161 [87.2%] in current study).

Of the 1162 adolescents, the mean age was 19 years (range 18-20) and 93.0% had completed high school (Table 1). A majority had previous SRH care experience (841/1161 [72.4%]) and 202/1160 (17.4%) had ever been pregnant. At baseline, 1012/1161 (87.2%) reported condomless sex in the past three months and 264/1158 (22.8%) reported >1 sex partner in the past three months. The sample had a mean perceived pregnancy risk score of 5.5 (range 1-7), which equates to feeling between “slightly likely” and “somewhat likely” to become pregnant, and a mean contraceptive knowledge score of 0.56 (range 0-1), which signifies achieving 56% accuracy on the knowledge test. About half were not using any non-barrier contraceptive method (596/1162 [51.3%]). Of those using a method, most had chosen either the oral pill (227/1162 [19.5%] of all adolescents; 227/566 [40.1%] of method users) or injectable contraceptives (211/1162 [18.2%] of all adolescents; 211/566 [37.3%] of method users). Baseline characteristics were notably different between non-users, non-LARC users, and LARC users, with only age being similar (Table 1).

Method consistency was similar between users of different methods at the three-month point. However, after nine months, 22/33 (66.7%) of Latina participants using IUDs were continuing their same method compared to consistency rates between 25.0%-53.3% for users of other non-barrier methods (Table 2). Latina participants using IUDs were 40% more likely to be consistent users over the nine-month period (aRR: 1.40; 95% CI: 1.11, 1.77) as compared to all other users combined. No other non-barrier methods were significantly associated with consistent use over a nine-month period. Results from sensitivity analyses produced substantively equivalent estimates. When comparing LARC users to non-LARC users, we did observe a significantly greater likelihood of consistency by the LARC users; however, these

findings were diminished in sensitivity analyses. Factors associated with nine-month method consistency included being older, having never been pregnant, having higher contraceptive knowledge, and having a greater perceived risk of pregnancy (Table 3).

When assessing longitudinal patterns in method use, we observed that 679/1162 (58%) of all Latina adolescents in our sample switched their non-barrier method choice at least once over the nine-month period, and 170/1162 (15%) were routine switchers, reporting different choices at each time point. Factors associated with method switching included being a first-time SRH visitor and not having recent condomless sex (Table 3). In terms of method discontinuation and non-use, 16/79 (20%) of baseline implant users were not using any method by the three-month time point compared to only 9-14% of those using other methods at baseline, and 191/596 (32%) of those not using any non-barrier method at baseline were still not using a method by the nine-month point (Figure 1). Factors associated with being a non-user over the nine-month period included not having a high school education, being a first-time SRH visitor, having more than one sexual partner in the past three months, having lower contraceptive knowledge, and having a lower perceived risk of pregnancy (Table 3).

## DISCUSSION

In this prospective longitudinal analysis of non-barrier contraceptive use patterns in a cohort of sexually active Latina adolescents not trying to become pregnant at baseline, we found that individuals using IUDs at study initiation were most likely to be using the same method nine months later. We also observed that Latina adolescents using implants had similar levels of consistency as those using other non-barrier methods over the nine-month period. A recently conducted meta-analysis of contraceptive continuation studies in adolescent populations similarly found that IUD users experienced higher continuation rates when compared to non-LARC users, but contrary to our findings did not find a significant difference between IUD and

implant users' continuation rates.[52] Our finding is noteworthy as LARC discontinuation requires a health care provider to remove the device, but this did not appear to be a barrier for Latina adolescents using implants in our study who desired to make a different contraceptive choice.

These findings also shed light on the frequency with which sexually active Latina adolescents appear to shift methods over a relatively short period of time. While baseline IUD users were most likely to remain on a consistent method over the nine-month period, consistency rates across all methods were relatively low ranging from 25.0%-66.7%. More importantly, over half of the population was not using a non-barrier method at baseline and over 487/596 (80%) of those not using a method reported engaging in recent condomless sex, despite not trying to become pregnant; furthermore, 191/596 (32%) of those not using non-barrier contraception at baseline were still not using any method after nine months. While the literature has documented the barriers and disparities that women of color, in particular, face in obtaining SRH services and contraception,[45,99–101] which has a subsequent impact on their ability to use contraception consistently, our findings suggest that even in a population with access to high-quality SRH care, there is a strong tendency among Latina adolescents to frequently shift methods. This highlights the importance of health centers having a variety of contraceptive options available, providers having an informed understanding about switching so they can help clients identify the best method for them, and the need for more research to better understand method preferences within this underserved population.

In our evaluation of predictors of method consistency, independent of baseline contraceptive choice, Latina female adolescents who were older, had never been pregnant, had higher contraceptive knowledge, and a greater perceived risk of pregnancy were more likely to be using the same method over nine months. These findings suggest that reproductive health interventions for Latina adolescents who do not desire pregnancy and wish to use non-barrier

contraception should focus on providing contraceptive knowledge and offering information on pregnancy risk to facilitate more consistent method use.

Although findings from this study cannot be generalized to all U.S. Latina female adolescents, given the limited data available for this population, these results provide meaningful insight into contraceptive use patterns among sexually active Latina adolescent females with similar SRH-seeking behaviors and respond to a noted gap in the literature.[102] Our study analyzes data from a large cohort of Latina adolescents with extremely high retention (1448/1542 [94%]); this coupled with the consistency of results across sensitivity analyses offers significant credibility to the findings. However, we rely upon self-reported data to capture non-barrier contraceptive use, which were not verified with medical records and may be subject to measurement error. We did not have historical data to inform an understanding of how long each individual had already been using her chosen method at enrollment, which may have influenced method consistency. Furthermore, we did not ask about use of nonhormonal behavioral methods, sterilization, or emergency contraception, which may have been some individuals' preferred methods.

While there is a controversial history associated with LARC because of the coercive and racist practices that have been used to overly promote, require, or force LARC upon marginalized groups, particularly women of color,[26,27,103] our study suggests that IUDs may offer sexually active Latina adolescents who wish to prevent pregnancy a more consistent and effective method than other non-barrier methods, similar to what is known about IUDs and LARC for other racial and ethnic groups. Our findings indicate that patient-centered contraceptive counseling for Latina adolescents who do not desire pregnancy may want to describe the greater contraceptive stability that IUDs, in particular, offer, while also accurately presenting all other methods and being responsive to the unique needs of the individual.

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## TABLES AND FIGURES

### Table 1. Baseline Characteristics for a Cohort of Sexually Active Latina Adolescent Females Attending California Sexual and Reproductive Health Centers, by Type of Non-Barrier Contraceptive Method Selected, June 2016-2019

| Baseline Characteristic | All Adolescents (*n* = 1162) | Not using a non-barrier method (*n* = 596) | User of non-LARC method (*n* = 453) | User of LARC method (*n* = 113) | *p* value |
|---|---|---|---|---|---|
| **Mean age (range)** | 19.0 (18-20) | 19.0 (18-20) | 19.0 (18-20) | 19.0 (18-20) | 0.78 |
| **High school education** | 1073/1154 (93.0%) | 549/591 (92.9%) | 425/450 (94.4%) | 99/113 (87.6%) | 0.04 |
| **First time at reproductive health clinic** | 320/1161 (27.6%) | 281/596 (47.1%) | 30/453 (6.6%) | 9/112 (8.0%) | <0.001 |
| **Ever pregnant** | 202/1160 (17.4%) | 94/595 (15.8%) | 65/452 (14.4%) | 43/113 (38.1%) | <0.001 |
| **Condomless sex in past three months** | 1012/1161 (87.2%) | 487/596 (81.7%) | 417/452 (92.3%) | 108/113 (95.6%) | <0.001 |
| **>1 sex partners in past three months** | 264/1158 (22.8%) | 152/594 (25.6%) | 74/451 (16.4%) | 38/113 (33.6%) | <0.001 |
| **Mean contraceptive knowledge (range)**[a] | 0.56 (0-1) | 0.53 (0-1) | 0.59 (0-1) | 0.61 (0-1) | <0.001 |
| **Mean pregnancy risk perception (range)**[b] | 5.5 (1-7) | 5.2 (1-7) | 5.8 (1-7) | 5.8 (1-7) | <0.001 |
| **Non-barrier contraceptive method** | | | | | |
| ***Not using non-barrier method*** | 596 (51.3%) | 596/596 (100%) | - | - | |
| ***Oral contraceptives*** | 227/1162 (19.5%) | - | 227/453 (50.1%) | - | |
| ***Patch*** | 8/1162 (0.7%) | - | 8/453 (1.8%) | - | |
| ***Ring*** | 7/1162 (0.6%) | - | 7/453 (1.6%) | - | |
| ***Injection*** | 211/1162 (18.2%) | - | 211/453 (46.6%) | - | |
| ***Implant*** | 80/1162 (6.9%) | - | - | 80/113 (70.8%) | |
| ***IUD*** | 33/1162 (2.8%) | - | - | 33/113 (29.2%) | |

[a] Contraceptive knowledge was assessed with ten items that asked participants whether certain factual statements were true or false. Participants who provided the correct response to an item were given a score of 1 for that item; participants who provided an incorrect response or no response were given a score of 0 for that item. Mean scale scores indicate the proportion of items out of all 10 items that each participant answered correctly.

[b] Pregnancy risk perception was assessed with two items using a 7-point semantic-differential scale that asked participants to indicate how likely they thought it would be that they would get pregnant over the course of a year if they: 1) were to have vaginal sex just once without using any birth control; and 2) were to have vaginal sex for a month without using any birth control; a score of 1 indicates feeling *Very unlikely* to become pregnant and a score of 7 indicates feeling *Very likely* to become pregnant.

**Table 2. Likelihood of Sexually Active Latina Adolescents Attending Sexual and Reproductive Health Centers in California Using a Consistent Non-Barrier Contraceptive Method Over Three- and Nine-Month Periods, by Baseline Discrete Method and Method Type Selected, June 2016-June 2019**

| | Three-Month Contraceptive Method Consistency | | | Nine-Month Contraceptive Method Consistency | | |
|---|---|---|---|---|---|---|
| | % Using Same Method After Three Months | Unadjusted Model RR (95% CI) | Final Model: Adjusted for gravidity[a] aRR (95% CI) | % Using Same Method After Nine Months | Unadjusted Model RR (95% CI) | Final Model: Adjusted for gravidity[a] aRR (95% CI) |
| **Baseline Non-Barrier Method[b]** | | | | | | |
| Oral Pill versus other non-barrier methods | 160/227 (70.5%) | 0.96 (0.87, 1.07) | 0.93 (0.84, 1.03) | 121/227 (53.3%) | 1.05 (0.89, 1.23) | 1.00 (0.86, 1.17) |
| Patch versus other non-barrier methods | 4/8 (50.0%) | 0.69 (0.34, 1.39) | 0.74 (0.37, 1.47) | 2/8 (25.0%) | 0.48 (0.14, 1.59) | 0.51 (0.15, 1.67) |
| Vaginal Ring versus other non-barrier methods | 5/7 (71.4%) | 0.99 (0.62, 1.59) | 0.95 (0.59, 1.53) | 3/7 (42.9%) | 0.82 (0.35, 1.95) | 0.77 (0.33, 1.82) |
| Injection versus other non-barrier methods | 163/211 (77.3%) | **1.12 (1.01, 1.24)** | **1.11 (1.00, 1.22)** | 103/211 (48.8%) | 0.91 (0.77, 1.08) | 0.91 (0.77, 1.07) |
| Implant versus other non-barrier methods | 49/79 (62.0%) | 0.84 (0.70, 1.01) | 0.89 (0.74, 1.07) | 41/77 (53.3%) | 1.03 (0.82, 1.29) | 1.11 (0.89 1.38) |
| IUD versus other non-barrier methods | 26/33 (78.8%) | 1.10 (0.91, 1.32) | **1.19 (1.01, 1.40)** | 22/33 (66.7%) | **1.31 (1.01, 1.69)** | **1.40 (1.11, 1.77)** |
| **Baseline Method Type** | | | | | | |
| Non-LARC (pill, patch, ring, or injection) | 332/453 (73.3%) | ref | ref | 229/453 (50.6%) | ref | ref |
| LARC (implant or IUD) | 75/112 (67.0%) | 0.91 (0.79, 1.05) | 0.98 (0.85, 1.13) | 63/110 (57.3%) | 1.13 (0.94, 1.36) | **1.23 (1.03, 1.46)** |

[a] Each final model was adjusted for gravidity based on an *a priori* decision. None of the other assessed variables met the criteria for confounding because they did not change the estimates by >10%.
[b] Reference group for each discrete contraceptive method are users of all other non-barrier methods combined.

**Table 3. Baseline Predictors of Method Non-Use, Switching, and Consistency over a Nine-Month Period Among a Cohort of Sexually Active Latina Adolescents Attending California Sexual and Reproductive Health Centers, June 2016-June 2019**

| Baseline Characteristic | Likelihood of Not Using a Non-Barrier Method[a] | Likelihood of Method Switching[b] | Likelihood of Method Consistency[c] | |
|---|---|---|---|---|
| | Unadjusted RR (95% CI) | Unadjusted RR (95% CI) | Unadjusted RR (95% CI) | Adjusted for baseline IUD use aRR (95% CI) |
| 19 years or older | 0.87 (0.67, 1.13) | 0.91 (0.83, 1.00) | **1.28 (1.09, 1.51)** | **1.28 (1.09, 1.51)** |
| High school education | **0.54 (0.37, 0.79)** | 1.03 (0.85, 1.26) | **1.74 (1.08, 2.81)** | 1.58 (0.99, 2.53)[d] |
| First time at reproductive health clinic | **1.63 (1.25, 2.11)** | **1.31 (1.20, 1.44)** | 1.04 (0.77, 1.41) | 1.06 (0.78, 1.44) |
| Ever pregnant | 1.11 (0.79, 1.55) | 1.08 (0.96, 1.23) | **0.66 (0.51, 0.86)** | **0.65 (0.50, 0.84)** |
| Condomless sex in past three months | 0.73 (0.52, 1.03) | **0.87 (0.77, 0.99)** | 1.10 (0.79, 1.54) | 1.10 (0.79, 1.54) |
| >1 sex partner in past three months | **1.37 (1.03, 1.81)** | 1.00 (0.89, 1.12) | 0.94 (0.76, 1.16) | 0.93 (0.76, 1.14) |
| High contraceptive knowledge | **0.64 (0.49, 0.84)** | 0.93 (0.85, 1.03) | **1.22 (1.03, 1.45)** | **1.21 (1.02, 1.43)** |
| High pregnancy risk perception | **0.57 (0.44, 0.74)** | 0.92, (0.84, 1.02) | **1.27 (1.05, 1.54)** | **1.25 (1.03, 1.53)** |

[a] The binary outcome was operationalized as either individuals who reported at all three time points (baseline, 3 months, and 9 months) that they were not currently using a non-barrier method (non-users, coded as 1) or everyone else (consistent method users and method switchers combined, coded as 0).
[b] The binary outcome was operationalized as either individuals who reported during at least one time point to be currently using a non-barrier method but didn't report using that same method during at least one other time point (method switchers, coded as 1) or everyone else (consistent method users and non-users combined, coded as 0).
[c] The binary outcome was operationalized as either individuals who reported at all three time points (baseline, 3 months, and 9 months) that they were currently using the same non-barrier method (consistent method users, coded as 1) or individuals who reported at baseline to be using one type of non-barrier method but reported at subsequent time points to be using either another method or to have discontinued use (inconsistent user, coded as 0). Individuals who reported at baseline that they were not using a non-barrier method were excluded from this analysis.
[d] Final model was also adjusted for gravidity because inclusion of it as a covariate shifted the effect estimate by >10%.

**Figure 1. Transitional Distributions of Non-Barrier Contraceptive Use Choices at 3- and 9-Month Follow-Up, by Baseline Method Selected**

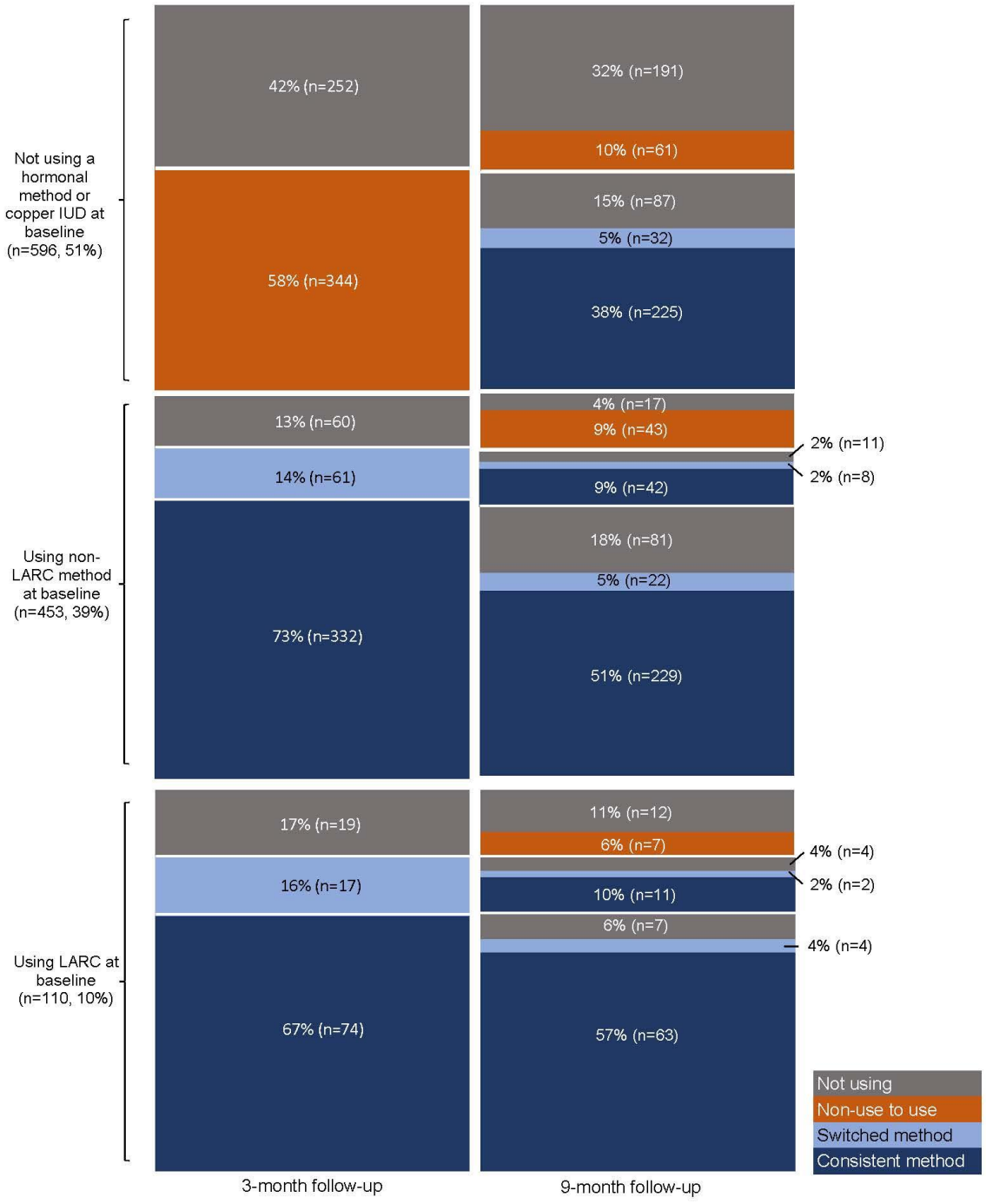

**FIGURE CAPTION**

We classified participants into three groups by their baseline contraceptive choice: not using hormonal methods or copper IUD; using non-LARC hormonal methods; and using LARC methods. At the 3-month follow-up, we compared each participant's baseline contraceptive use response to their 3-month response. At the 9-month time point, we compared each 3-month response to their 9-month response. We categorized participants into four groups at each time point: not using (or no longer using) hormonal methods or copper IUD; change from non-use to use of hormonal methods or copper IUD; switch in the type of non-barrier method used; and consistent use of the non-barrier contraceptive method reported at the prior time point. In the figure, each colored bar in the 3-month column represents the proportionate distribution of participants in the particular baseline group who made the contraceptive use choice associated with the color (see legend); each colored bar in the 9-month column represents the proportionate distribution of participants in a particular combined baseline/3-month group who made the contraceptive use choice associated with the color. Proportions displayed in each bar, in both columns, are calculated out of the full baseline group.

# CHAPTER 3: DUAL PROTECTION WITH CONDOMS AND OTHER CONTRACEPTIVE METHODS AMONG OLDER LATINA ADOLESCENTS: A PROSPECTIVE COHORT STUDY

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# Dual Protection with Condoms and Other Contraceptive Methods Among Older Latina Adolescents: A Prospective Cohort Study

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## ABSTRACT

**Context:** Research in predominantly non-Hispanic white populations indicates that long-acting reversible contraception (LARC) users may be less likely to use dual protection. However, it is not clear whether this association prevails among Latina adolescents, who experience disproportionately higher STI rates and are less likely to use dual protection.

**Methods:** We conducted a cohort study of 1278 Latina females aged 18-19 years who attended California sexual and reproductive health (SRH) centers between June 2016-June 2020. Individuals self-reported data at baseline, and three- and nine-months post-baseline. We used Poisson regression to assess the effect of contraceptive method use on condomless vaginal sex and dual protection use with confirmation from marginal structural modeling.

**Results:** After adjustment, non-barrier contraceptive users had 1.17 times the rate of condomless vaginal sex during the recent three-month period compared to non-users (aIRR 1.17 [95% CI 1.09, 1.25]). This association was stable for all subgroups of non-barrier methods. However, among non-barrier contraceptive users, those using LARC or an injection had significantly lower rates of any dual protection use over the recent three-month period than pill, patch, and ring users (LARC vs. pill/patch/ring aIRR: 0.73 [0.57, 0.93]; injection vs. pill/patch/ring aIRR: 0.69 [0.49, 0.97]).

**Conclusions:** Users of any non-barrier contraception were more likely to have condomless sex than non-users, but LARC/injection users were less likely to use any dual protection than pill/patch/ring users. SRH programming for Latina adolescents who select non-barrier methods, in particular LARC or injection, should include information on dual protection to prevent against unwanted pregnancy and STIs.

## INTRODUCTION

Nearly half of sexually transmitted infections (STIs) in the United States (U.S.) today are among adolescents,[60] and while U.S. adolescent birth rates have dramatically declined, they still remain significantly higher than other industrialized nations.[1,2] While use of non-barrier contraceptives, condoms, and dual methods (combined use of non-barrier contraception and condoms) is rising overall,[36] and could mitigate STIs and unwanted pregnancy, there are important differences in contraceptive and condom use among adolescents of different racial and ethnic groups.[104,105] Recent cross-sectional data report that Latina adolescents appear less likely to use effective contraceptive methods[35,36,48] and dual protection.[35,36] In conjunction, Latina adolescents are also at disproportionately greater risk for STIs, experiencing rates up to three times greater than their non-Latina white counterparts.[106]

Coinciding with the STI increase among adolescents is growing use of long-acting reversible contraception (LARC, which includes implants and IUDs) by females aged 15-19 years.[61] This has prompted investigation of whether users of specific contraceptive methods, notably LARC, are more likely to engage in condomless sex. The bulk of research thus far among women of any reproductive age[62–64] and adolescents[65–68] has found evidence that LARC users appear less likely to use dual protection than those using short-acting hormonal methods (pill, patch, and ring). However, most of these analyses have relied upon cross-sectional data,[62,63,65,67,68] which cannot explore the influence of contraceptive method use on sexual behaviors over time. Furthermore, there are some conflicting data, which have found no difference in the receipt of STI testing services between adolescents using LARC and non-LARC methods,[70] and no difference in dual method use between adolescents exposed or not exposed to a LARC promotion intervention.[71] These studies suggest that adolescents' use of highly effective methods may not lead to a diminished perception of their STI risk or decreased likelihood of condom use. These mixed findings, along with data indicating that Latina adolescents use

contraceptives and condoms differently than their counterparts in other racial and ethnic groups, and the disproportionate rate of STIs experienced by Latina adolescents, leaves a notable gap in the literature.

Taking advantage of longitudinal data from more than 1,500 Latina adolescents who participated in a randomized controlled trial (RCT) of a sexual and reproductive health (SRH) intervention, the objective of this study was to assess whether Latina adolescents using different types of non-barrier contraceptive methods, including LARC, were more likely to engage in condomless sex and less likely to use dual protection. Our aim was to broaden understanding of Latina adolescents' use of dual protection to inform patient-centered contraceptive counseling and SRH interventions that reduce their risk for unwanted pregnancy and STIs.

## METHODS

### Study Design and Setting

Between June 2016-June 2020, the Video Health Study investigated the efficacy of a 23-minute SRH video intervention among a cohort of >1,500 Latina adolescents who presented at eight SRH centers in California (NCT#03238313). Individuals who met the parent study eligibility criteria and provided written informed consent were randomized 1:1 to receive either the SRH intervention video, which aimed to promote effective contraceptive use, dual methods of protection, and STI/HIV testing, or a control video, which contained no SRH information. Participating health centers were part of an affiliate SRH network and selected on the basis of serving many Latina or Black adolescents (parent study target populations), clinic staff who could recruit participants, and being geographically located in underserved areas. We made use of the parent RCT data to conduct a secondary longitudinal analysis of the association between non-barrier contraceptive use and two outcomes – any condomless sex and any dual protection use in a recent three-month period - in the study population.

**Study Population**

Individuals included in the parent study had to meet the following eligibility criteria: self-identify as female; self-identify as Black and/or Latina; be 18 or 19 years old; have visited a participating parent study SRH center; and be deemed appropriate for enrollment by clinic staff with regards to physical and mental health. Individuals who knew they were pregnant or were trying to get pregnant were excluded. Only those who provided written informed consent were enrolled. All participants were provided with SRH counseling at the baseline visit. The parent study protocol was approved by the Sterling Institutional Review Board.

For this secondary analysis, only participants who identified as Latina and self-reported that they had been honest were included. Additionally, we restricted our sample to those who reported making a consistent non-barrier contraceptive choice, specifically those who were either not using any method or using the same method at two sequential study visits.

**Data Collection**

Data were collected at baseline, and three- and nine-months post-baseline via self-administered questionnaires and completed mostly electronically, with back-up paper and phone administrations used <1% of the time. The instrument contained 75 items that measured contraceptive knowledge and asked participants to self-report background characteristics, contraceptive use, sexual behaviors and experiences, belief of risk, and intentions related to sexual behaviors.

**Exposure Measures**

In each questionnaire, participants were asked which of the following methods of prescription birth control they were currently using and could select one response from the following list: none; oral contraceptives; patch; shot/injection; ring; implant; IUD. We used participants'

responses to this question at two sequential study visits to construct the following exposure groups: individuals who did not select a non-barrier method (non-users) at both time points and those who reported use of the same type of non-barrier contraceptive (non-barrier users) at both time points. We further disaggregated non-barrier users into different sub-groups: those who reported using the pill, patch, or ring; those who reported using any non-LARC method (pill, patch, ring, or injection); those who reported using just the injection; and those who reported using LARC (IUD or implant).

**Outcome Measures**

In each questionnaire, participants were asked the following series of questions about their engagement in vaginal sex in the past three months: How many times have you had vaginal sex?; Have you had vaginal sex without using a condom?; How many times have you had vaginal sex without using a condom?. Participants' responses to these questions were used to construct two outcome measures: a binary indicator of self-reported condomless vaginal sex in the past three months; and a binary indicator of any dual protection use in the past three months, operationalized as individuals using a consistent non-barrier contraceptive method at two sequential study visits and who reported at least some condom use in the past three months.

**Statistical Analysis**

Baseline differences between non-users, and users of pill/patch/ring, injections, and LARC were assessed using ANOVA for continuous variables and Pearson's chi-squared test for categorical variables.

To assess the effect of non-barrier contraceptive method use on engagement in condomless sex and use of dual protection, we made several comparisons using Poisson regression with a

robust variance estimator. Contraceptive use was analyzed as a time-dependent exposure. Users of any non-barrier method, LARC, injection, and pill/patch/ring were compared to individuals not using any non-barrier contraception. The following method subgroups were then compared in analyses in which we excluded individuals who reported not using any non-barrier contraception: LARC to non-LARC users; LARC to injection users; LARC to pill/patch/ring users, and injection to pill/patch/ring users. We ran univariate models and then adjusted models that included the following confounders identified *a priori*: age; education; living in single parent household; and past contraceptive use history.

Due to the likelihood of time-dependent confounding in the data, we conducted a separate analysis using marginal structural models (MSM) to estimate the causal effect of non-barrier contraceptive use on engagement in condomless vaginal sex and use of dual protection (Figure 2). Contraceptive use was again analyzed as a time-dependent exposure. For each of the exposure comparisons, we computed stabilized inverse probability weights using logistic regression to predict the probability of that particular type of contraceptive use at each visit. To improve weight behavior, weights were truncated, replacing values in the 99th and 1st percentiles to be equal to the percentile weight value. Each weight was then used in the pooled regression models that also adjusted for the time independent confounders (age, education, and living in a single parent household, and past contraceptive use history).

For both types of statistical models, we ran a number of sensitivity analyses to assess the robustness of effect estimates: including data from participants who reported they had not been honest (n=2); excluding inconsistent exposure responses from individuals who reported currently using a non-barrier method at baseline and simultaneously reported not using a method in the past three months (excluded n=70) - the baseline questionnaire was completed before seeing a SRH provider so these two circumstances could not co-occur; excluding

questionnaires completed >30 days after the questionnaire target completion date (excluded n=410).

Finally, we conducted several exploratory analyses. First, we assessed whether there was any evidence of effect modification by the parent study randomization assignment; this was explored because one of the aims of the SRH video intervention was to influence dual method use, so we hypothesized that there may have been a differential effect between those randomized to intervention or control. We also investigated whether an individual's perception of their STI/HIV risk or reported receipt of recent STI testing at baseline modified the non-barrier contraception and condom use association, with the rationale being that those with a greater perceived STI/HIV risk or more recent STI testing may be more inclined towards protective behaviors, notably condom use. These analyses were conducted by adding an interaction term between the exposure measure and the potential moderator in each of the final MSM models and performing a Wald test to evaluate statistical significance of the interaction term. We also performed mediation analyses to evaluate whether the associations observed were mediated by an individual's perceived STI/HIV risk, with the aim of identifying a possible intervening factor. All analyses were conducted in Stata 16.1.

**RESULTS**

This study included 1,278 Latina female adolescents (72.2% of the parent RCT sample) with 94% providing data at all time points. The mean age was 19 years (range: 18-20), 93.3% had received a high school education, and 29.7% reported living in a single parent household. Almost three-quarters (71.7%) reported previously receiving reproductive health care and 16.2% had ever been pregnant. The majority reported having vaginal sex in the past three months (91.9%) and 79.4% reported at least some condomless sex during that time. About one-quarter (22.5%) had >1 sex partner in the past three months. About half of the sample (51.0%) did not

report using a non-barrier contraceptive method at baseline. Of those using a method, most had chosen either oral contraceptives (39.8%) or injection (37.2%). Baseline characteristics between non-users, pill/patch/ring users, injection users, and LARC users were notably different, with only education, single parent household living, and the proportion reporting recent vaginal sex being similar between the groups (Table 4). Figure 3 shows the frequencies of different types of vaginal sex acts in the recent three-month period disaggregated by type of non-barrier contraception.

When comparing users of different types of non-barrier methods to non-users, Latina adolescents using any non-barrier contraceptive method had 1.17 times the rate of condomless sex in the recent three-month period as non-users (aIRR 1.17 [95% CI 1.09, 1.25], Table 5). When disaggregating to different methods, the rates of condomless sex were consistent across user groups and the associations between contraceptive method use and condomless sex were similar to the aggregate association. Furthermore, when we limited our analyses to users of non-barrier methods and compared the rate of recent condomless sex for LARC users to the rates for those using any non-LARC method, the injection, or pill/patch/ring, we did not find any statistically significant associations (Table 6), indicating similar rates of condom use paired with use of each type of effective contraceptives. Results from all sensitivity analyses produced similar findings.

When assessing the rate of any dual method use in the past three months among users of different non-barrier methods, we found that Latina adolescents using more highly effective methods (IUD, implant, or injection) had lower rates of dual protection than those using short-acting hormonal methods (pill, patch, ring). Specifically, LARC users had 0.73 times the rate (aIRR: 0.73 [0.57, 0.93] and injection users had 0.69 times the rate (aIRR: 0.69 [0.49, 0.97]) of any recent dual method use when compared to pill/patch ring users (Table 7).

In our exploratory analysis of possible effect modifiers, we found no statistical evidence that the parent study intervention assignment, baseline STI/HIV risk perception level, or reported receipt of recent STI testing at baseline significantly modified the relationships between non-barrier contraceptive use and recent condomless vaginal sex, or use of more highly effective methods and recent use of dual protection (data not shown). Additionally, when we assessed whether an individual's STI/HIV risk perception potentially mediated these associations, we also found no statistical evidence to support these hypotheses (data not shown).

## DISCUSSION

Our longitudinal study found that Latina adolescents using any method of non-barrier contraception had a higher rate of recent condomless vaginal sex when compared to those not using any non-barrier contraception; this relationship did not differ between users of different methods. However, among non-barrier method users, Latina adolescents using LARC (IUD or implant) or the injection had lower rates of any dual method use compared to those using short-acting methods (pill, patch, ring). Cross-sectional research has found similar evidence that use of LARC[65,67,68] or user-independent methods combined (IUD, implant, and injection)[62,63] may be associated with a lower likelihood of condom use when compared to users of other methods, but have not made comparisons to non-users. Furthermore, these findings come from predominantly non-Latina white female populations and should not be applied to Latina adolescents who are known to have different contraceptive and condom use behaviors and preferences.[35,36,44,48,94] Our results suggest that use of any non-barrier contraception, and not LARC specifically, appears to increase the likelihood that Latina adolescents will engage in any condomless vaginal sex. However, among non-barrier contraceptive users, Latina adolescents choosing more highly effective methods may be less inclined to use any dual protection than those using the pill, patch, or ring.

A recently conducted prospective cohort study of Latina adolescents slightly younger than those in our study reported similar findings, noting that lower condom use was associated with use of any type of non-barrier method.[69] Our research builds on this analysis, using a much larger cohort of older Latina adolescents and more sophisticated analytic techniques, which allowed us to make full use of the available longitudinal data and control for potential time-varying confounders, such as engagement in sexual activity. While we did not have information on relationship status for individuals in our sample and we do rely upon self-reported data from participants, additional strengths of our study include an exceptionally high follow-up rate (94%) and substantively comparable results across all sensitivity analyses.

To better understand potential factors that may modify the significant associations observed, we assessed whether these were differences in the estimated effects between Latina adolescents with self-reported low or high STI/HIV risk perceptions, and those with or without a history of recent STI testing. However, we found no qualitative or statistical evidence of effect modification. Furthermore, our analysis of STI/HIV risk perception as a possible mediator of these relationships also produced null findings. Taken together, this suggests that an individual's awareness of their own STI status and perceived susceptibility to STI/HIV may not be sufficient to influence condom use behaviors. More research is needed to understand characteristics associated with dual method use and identify possible intervening factors that increase the likelihood of this protective behavior among Latina adolescents.

Future studies should also explore the possible long-term outcomes associated with lower condom use, specifically whether Latina adolescents using any type of non-barrier method or those using highly effective methods are at an increased risk of acquiring STIs. Findings produced from a cohort of individuals of any reproductive age, in which the population was equally split between individuals identifying as white or black, found that LARC users were more

likely to have had an incident STI over a 12-month period compared to users of other methods,[107] but no known research to-date has investigated this question in a racially and ethnically diverse sample of adolescents.

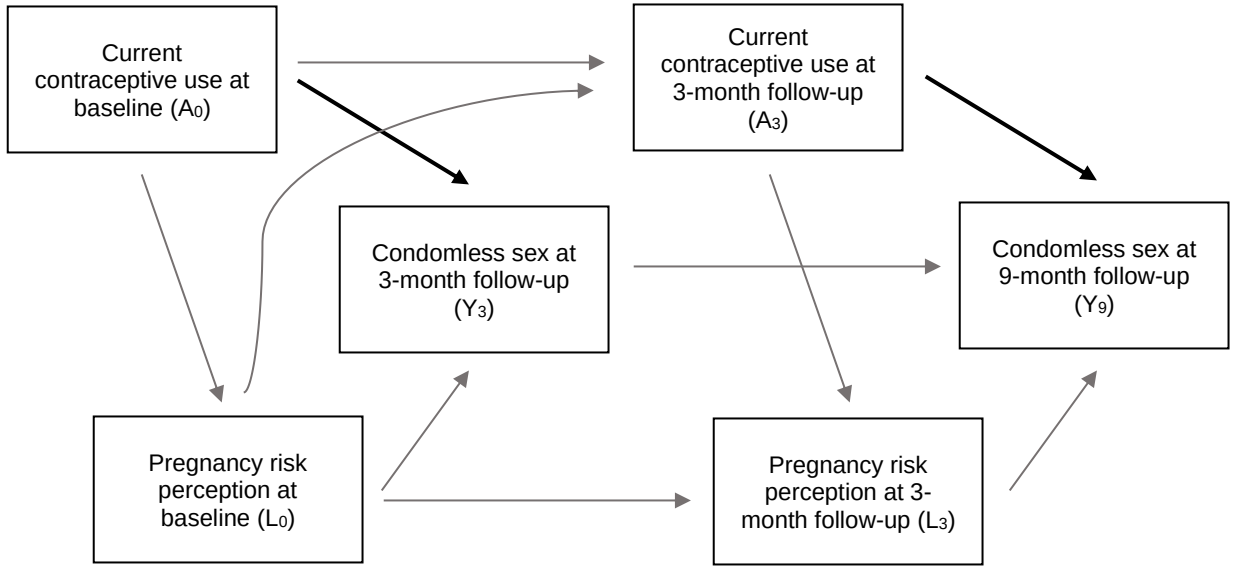
Our findings, together with the existing literature,[69] provide corroborating evidence of the potential for Latina adolescents to reduce condom use when they are using non-barrier contraceptives. This result highlights the necessity of including robust, medically accurate information about dual method use during patient-centered contraceptive counseling and in SRH interventions for Latina adolescents, particularly for those using user-independent methods, to help mitigate the disproportionately higher rates of STIs experienced by this population.

**ACKNOWLEDGEMENTS**

This study would not have been possible without the participation of the Latina individuals who chose to enroll in the study and contribute data. We'd also like to acknowledge Dr. Eric Jenner and Dr. Sarah Walsh at The Policy & Research Group, who led the parent RCT under which these data were collected. Additionally, this study was implemented through the hard work and dedication of staff from Planned Parenthood Mar Monte, including Natasha Felkins, Jessica Morales-Valdez, and Julie Smith-Reid. Finally, this study would not have been possible without the diligent work of our research assistants, including Stephanie Hall, Kathleen Keh, Natalie Madrigal-Ortiz, Nicollette Moore, Victoria Romo, Elizabeth Aviña, and Isabell Virrey. The parent RCT data collection was supported by a grant from the U.S. Office of Population Affairs [TP2AH000036, 2016]. The content of this article is the responsibility solely of the author and does not necessarily represent the official views of the funding organizations.

**TABLES AND FIGURES**

**Figure 2. Simplified Directed Acyclic Graph of the Relationships Between Contraceptive Use (Exposure), Pregnancy Risk Perception (Time-Dependent Confounder), and Condomless Sex (Outcome) at Study Time Points**



## Table 4. Baseline Characteristics of Latina Adolescents by Non-Barrier Contraceptive Method Being Used

| Baseline Characteristic | Non-Users (n=652) | Pill, Patch, Ring Users (n=265) | Injection Users (n=233) | IUD and Implant Users (n=128) | p-value | All Adolescents (n=1,278) |
|---|---|---|---|---|---|---|
| **Demographics** | | | | | | |
| Mean age (range) | 19 (18-20) | 19 (18-20) | 19 (18-20) | 19 (18-20) | 0.048 | 19 (18-20) |
| High school education | 93.3% | 95.1% | 92.2% | 91.4% | 0.484 | 93.3% |
| Living in single parent household | 27.8% | 34.3% | 31.8% | 26.6% | 0.173 | 29.7% |
| **SRH History, Risk Perceptions, and Knowledge** | | | | | | |
| First time at reproductive health clinic | 47.5% | 9.1% | 6.4% | 9.4% | <0.001 | 28.3% |
| Ever pregnant | 15.8% | 10.2% | 15.1% | 32.0% | <0.001 | 16.2% |
| Mean pregnancy risk perception (range)[a] | 5.2 (1-7) | 5.9 (1-7) | 5.7 (1-7) | 5.8 (1-7) | <0.001 | 5.5 (1-7) |
| Mean STI/HIV risk perception (range)[a] | 4.6 (1-7) | 4.9 (1-7) | 4.4 (1-7) | 5.1 (1-7) | 0.013 | 4.7 (1-7) |
| Mean contraceptive knowledge (range)[b] | 0.5 (0-1) | 0.6 (0.1-1) | 0.6 (0.2-1) | 0.6 (0.2-1) | <0.001 | 0.6 (0-1) |
| **Sexual Behaviors in Past Three Months** | | | | | | |
| Any vaginal sex | 90.3% | 94.0% | 94.0% | 91.4% | 0.169 | 91.9% |
| Mean number of vaginal sex acts (range) | 12 (0-500) | 20 (0-300) | 18 (0-180) | 16 (0-128) | <0.001 | 15 (0-500) |
| Any condomless vaginal sex | 73.5% | 84.2% | 86.6% | 86.7% | <0.001 | 79.4% |
| Mean number of condomless vaginal sex acts (range) | 7 (0-250) | 16 (0-298) | 15 (0-180) | 14 (0-128) | <0.001 | 11 (0-298) |
| % vaginal sex acts that were condomless | 48.5% | 65.7% | 71.3% | 70.8% | 0.005 | 58.5% |
| >1 sex partner | 25.7% | 20.0% | 11.7% | 31.3% | <0.001 | 22.5% |
| Use of non-barrier method | 15.1% | 92.8% | 87.1% | 91.4% | <0.001 | 52.0% |
| Dual method use during at least some vaginal sex acts[c] | 0% | 50.7% | 36.3% | 42.7% | <0.001 | 22.7% |
| **Current Non-Barrier Contraceptive Method** | | | | | | |
| None | 100% | - | - | - | | 51.0% |
| Oral contraceptives | - | 94.0% | - | - | | 19.5% |
| Patch | - | 2.3% | - | - | | 0.5% |
| Ring | - | 3.8% | - | - | *n/a* | 0.8% |
| Injection | - | - | 100% | - | | 18.2% |
| Implant | - | - | - | 72.7% | | 7.3% |
| IUD | - | - | - | 27.3% | | 2.7% |

[a] Pregnancy risk perception and STI/HIV risk perception were each assessed with two items using a seven-point semantic-differential scale that asked participants to indicate how likely they thought certain events would happen over the course of a year if they engaged in specific risk behaviors. Higher scores indicate a greater perceived likelihood of risk.

[b] Contraceptive knowledge was assessed with ten true-or-false factual statements; scores indicate the proportion of items that each participant answered correctly.

[c] Proportion reported is out of the 995 Latina adolescents (481 non-users, 229 pill/patch/ring users, 182 injection users, and 103 LARC users) whose dual method use could be discerned. Dual method use was operationalized in the following way: participants who reported at two sequential study visits that they were not currently using prescription birth control and who also reported having vaginal sex in the past three months were coded as not using dual methods (dual methods=0); participants who reported at two sequential study visits to be consistently using the same method of prescription birth control and who reported having an equivalent number of condomless vaginal sex acts as total vaginal sex acts in the past three months were coded as not using dual methods (dual methods=0); and participants who reported at two sequential study visits to be consistently using the same method of prescription birth control and who reported having fewer condomless vaginal sex acts than total vaginal sex acts in the past three months were coded as using dual methods (dual methods=1).

## Table 5. Condomless Vaginal Sex in a Three-Month Period Comparing Non-Barrier Contraceptive Users to Non-Users

| Non-Barrier Contraceptive Method | % reporting condomless vaginal sex over three-month period | Unadjusted model Incidence Rate Ratio (95% CI) | Adjusted model Incidence Rate Ratio (95% CI)[a] | Adjusted MSM Incidence Rate Ratio (95% CI)[b] |
|---|---|---|---|---|
| All Latina adolescents | 78.5% | - | - | - |
| Non-users | 68.9% | Ref | Ref | Ref |
| Non-barrier contraceptive users | 84.1% | **1.22 (1.14, 1.30)** | **1.19 (1.11, 1.27)** | **1.17 (1.09, 1.25)** |
| LARC users (IUD or implant) | 83.0% | **1.20 (1.11, 1.30)** | **1.18 (1.07, 1.29)** | **1.15 (1.04, 1.26)** |
| Injection users | 85.3% | **1.24 (1.15, 1.33)** | **1.22 (1.10, 1.35)** | **1.21 (1.07, 1.37)** |
| Pill, patch, ring users | 84.0% | **1.22 (1.13, 1.31)** | **1.19 (1.10, 1.29)** | **1.20 (1.10, 1.30)** |

[a] Adjusted for the following confounders identified *a priori*: age; education; living in single parent household; and past contraceptive use history.
[b] MSM = Marginal structural model. Adjusted for the following confounders identified *a priori*: age; high school education; living in single parent household; and past contraceptive use history. Weights used in the pooled regression models were constructed with the following variables: age; high school education; living in single parent household; past contraceptive use history; time-dependent frequency of SRH care; time-dependent frequency of vaginal sex in past 3 months; time-dependent number of sex partners in past 3 months; time-dependent ever pregnant; time-dependent times pregnant; time-dependent pregnancy risk perception; and time-dependent contraceptive knowledge. When necessary, weights were truncated at the 1$^{st}$ and 99$^{th}$ percentiles to improve weight behavior.

## Table 6. Condomless Vaginal Sex in a Three-Month Period Comparing Subgroups of Non-Barrier Contraceptive Method Users

| Non-Barrier Contraceptive Method | % reporting condomless vaginal sex over three-month period | Unadjusted model Incidence Rate Ratio (95% CI) | Adjusted model Incidence Rate Ratio (95% CI)[a] | Adjusted MSM Incidence Rate Ratio (95% CI)[b] |
|---|---|---|---|---|
| **LARC versus Non-LARC Users** | | | | |
| Non-LARC users (pill, patch, ring, injection) | 84.6% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 83.0% | 0.98 (0.92, 1.05) | 0.96 (0.89, 1.04) | 0.95 (0.87, 1.03) |
| **LARC versus Injection Users** | | | | |
| Injection users | 85.3% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 83.0% | 0.97 (0.90, 1.05) | 0.95 (0.87, 1.04) | 0.95 (0.86, 1.04) |
| **LARC versus Pill, Patch, Ring Users** | | | | |
| Pill, patch, ring users | 84.0% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 83.0% | 0.99 (0.92, 1.06) | 0.97 (0.89, 1.05) | 0.95 (0.86, 1.04) |

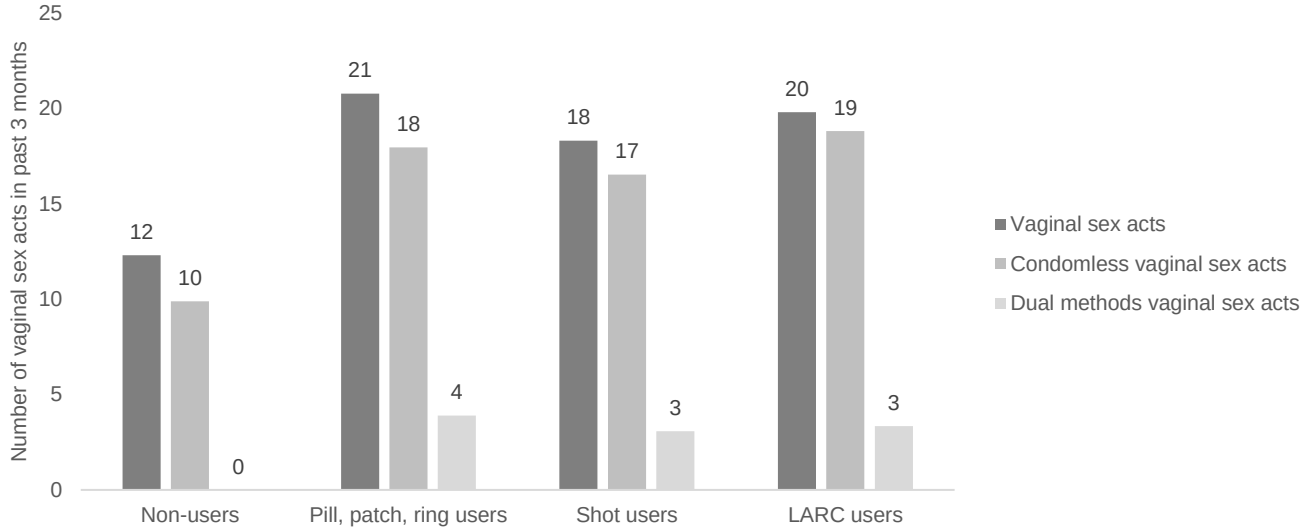
[a] Adjusted for the following confounders identified *a priori*: age education; living in single parent household; and past contraceptive use history.
[b] MSM = Marginal structural model. Adjusted for the following confounders identified *a priori*: age; high school education; living in single parent household; and past contraceptive use history. Weights used in the pooled regression models were constructed with the following variables: age; high school education; living in single parent household; past contraceptive use history; time-dependent frequency of SRH care; time-dependent frequency of vaginal sex in past 3 months; time-dependent number of sex partners in past 3 months; time-dependent ever pregnant; time-dependent times pregnant; time-dependent pregnancy risk perception; and time-dependent contraceptive knowledge.

## Table 7. Dual Method Use in a Three-Month Period Comparing Users of Different Non-Barrier Contraceptive Methods

| Non-Barrier Contraceptive Method | % reporting dual method use over three-month period | Unadjusted model Incidence Rate Ratio (95% CI) | Adjusted model Incidence Rate Ratio (95% CI)[a] | Adjusted MSM Incidence Rate Ratio (95% CI)[b] |
|---|---|---|---|---|
| **LARC versus Non-LARC Users** | | | | |
| Non-LARC users (pill, patch, ring, injection) | 43.9% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 38.6% | 0.88 (0.74, 1.05) | **0.80 (0.64, 0.99)** | **0.79 (0.63, 0.99)** |
| **LARC versus Injection Users** | | | | |
| Injection users | 38.6% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 38.6% | 1.00 (0.81, 1.24) | 0.87 (0.66, 1.15) | 0.86 (0.65, 1.13) |
| **LARC versus Pill, Patch, Ring Users** | | | | |
| Pill, patch, ring users | 48.0% | Ref | Ref | Ref |
| LARC users (IUD or implant) | 38.6% | **0.80 (0.67, 0.97)** | **0.72 (0.57, 0.91)** | **0.73 (0.57, 0.93)** |
| **Injection versus Pill, Patch, Ring Users** | | | | |
| Pill, patch, ring users | 48.0% | Ref | Ref | Ref |
| Injection users | 38.6% | **0.80 (0.67, 0.97)** | 0.83 (0.62, 1.11) | **0.69 (0.49, 0.97)** |

[a] Adjusted for the following confounders identified *a priori*: age; education; living in single parent household; and past contraceptive use history.
[b] MSM = Marginal structural model. Adjusted for the following confounders identified *a priori*: age; high school education; living in single parent household; and past contraceptive use history. Weights used in the pooled regression models were constructed with the following variables: age; high school education; living in single parent household; past contraceptive use history; time-dependent frequency of SRH care; time-dependent frequency of vaginal sex in past 3 months; time-dependent number of sex partners in past 3 months; time-dependent ever pregnant; time-dependent times pregnant; time-dependent pregnancy risk perception; and time-dependent contraceptive knowledge.

**Figure 3. Frequency of Total, Condomless, and Dual Method Vaginal Acts Sex in Past Three Months, by Non-Barrier Contraceptive Method Being Used**



# CHAPTER 4: HOW FUTURE AMBITIONS, FEAR, AND FAMILIAL SUPPORT SHAPE AND INFLUENCE LATINA ADOLESCENTS' CONTRACEPTIVE DECISION-MAKING

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# How Future Ambitions, Fear, and Familial Support Shape and Influence Latina Adolescents' Contraceptive Decision-Making

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## ABSTRACT

**Context:** Latina adolescents are less likely to use effective contraceptive methods, and factors influencing their contraceptive decision-making, particularly with the increasing availability of long-acting reversible contraception (LARC), are not well understood. Research is needed to explore the complexities of this process to inform patient-centered contraceptive counseling and sexual and reproductive health (SRH) programs that best meet their individual needs.

**Methods:** We conducted semi-structured interviews with self-identified Latina female adolescents aged 18-19 years who had received SRH services at eight clinics in California and were participants in a randomized controlled trial of a SRH video intervention. We used a grounded theory approach to analyze the data.

**Results:** Among interviews with 37 participants, three themes emerged. Latina adolescents with future ambitions appear inclined to use more effective contraceptive methods but may be swayed to not use contraception by strong partner or family influence against contraception. Second, Latina adolescents may have difficulty using certain contraceptive methods consistently despite having clear intentions to avoid pregnancy, but fear of contraception, particularly LARC, may inhibit them from selecting more efficacious, user-independent methods. Third, those who expect to receive both familial support and positive emotions if they were to become pregnant appear less inclined to use effective contraception.

**Conclusion:** Patient-centered contraceptive counseling and SRH programs for Latina adolescents will have greater success if they are attentive and responsive to their ambitions, partner influence, pregnancy intentions, method consistency, fear, and expected familial response to pregnancy, all of which are interconnected, and influence their contraceptive decision-making.

## INTRODUCTION

Contraception can offer individuals who do not want to become pregnant one form of reproductive autonomy. Quantitative data indicate that Latina adolescents are less likely to use effective contraceptive methods than their non-Latina white peers,[35,36,48,108] but limited research has been conducted to explore motivators and barriers to contraceptive use within this population. Several quantitative and qualitative studies have explored both individual- and interpersonal-level factors to better understand Latina individuals' contraceptive decision-making and method selection. Interpersonal factors assessed in the literature include the role that parents,[72,109] partners,[72,74–76] peers,[77] and health care providers[78,79] play in Latina adolescents' contraceptive choices. Research indicates that Latina adolescents desire open communication with their parents or health care providers about contraception,[72,78,79,109] partners and peers may directly influence their contraceptive decision-making through information-sharing,[75,77] and that the commitment they receive from a partner and the communication about contraception with that individual may be associated with use of effective methods.[74–76]

In the existing literature, a few studies have explored the relationships between Latina contraceptive use and individual-level factors, including contraceptive knowledge,[80] pregnancy intentions,[81] acculturation (the process of adapting to a new culture),[74,82,83,88] and perceptions of or personal experience with contraceptive side effects[84,85] and/or childbearing.[74,86] Some studies have suggested that while Latina adolescents desire contraceptive information on topics such as the potential side effects,[84] they may have less awareness of contraceptive methods than their white counterparts.[80] One study noted that receipt of misinformation or a personal history with negative side effects may lead to reliance on less effective methods.[87] And while it is not clear whether Latina adolescents' level of acculturation[74,82,83,88] or pregnancy intentions[81] influence the efficacy of the method selected, Latina individuals who have given birth appear more likely to use effective contraception.[74]

Prior research has served to establish an initial understanding of circumstances that may independently affect Latina adolescents' contraceptive choices, but we are unaware of any studies that have explored the intersection of these factors, and there is a paucity of contemporary research on Latina adolescents' decision-making in the context of having access to long-acting reversible contraception (LARC). Furthermore, there have been repeated calls for research that delves into the complexities of the this process to inform counseling practices that better meet the reproductive health needs of individuals and support those who wish to prevent pregnancy.[81,89,90] In response to these needs, we leveraged interview data in which Latina adolescents shared their contraceptive use stories with us to qualitatively explore how factors previously cited in the literature may interact in their contraceptive decision-making process and influence non-barrier method selection. We also developed a conceptual model to visualize the interconnectedness of these factors.

## METHODS

### Study Design and Participants

The Video Health Study was an individual-level randomized controlled trial (RCT) implemented between June 2016-June 2020 at eight sexual and reproductive health (SRH) centers in California to assess the efficacy of a SRH video intervention (NCT#03238313). The RCT enrolled 1,770 English-speaking, Latina and Black female adolescents ages 18-19 years who visited participating SRH centers, were not currently or planning to become pregnant, were in appropriate physical and mental health for the study, and completed an informed consent process. Enrolled participants were randomized at a 1:1 ratio, stratified by site, to receive either: 1) Plan A, a 23-minute SRH video designed to promote effective contraceptive use, use of dual methods of protection, and HIV/STI testing, or 2) a control video about the harms of cigarettes, which contained no SRH information.[110] RCT participants completed questionnaires at baseline, prior to randomization, and at three- and nine-months post-baseline.

With the intent to better understand the cognitive processes and potential factors influencing Black and Latina adolescents' sexual and reproductive health decisions, the RCT team designed a nested qualitative study. We began recruiting a purposive sample of Latina and Black RCT participants in May 2019; individuals eligible were those who were completing their nine-month follow-up questionnaire for the RCT (target sample=40 participants). RCT participants were contacted in person (during completion of the nine-month questionnaire) or via telephone by research assistants; those interested in participating in the qualitative study provided additional informed consent. We continued recruitment for the qualitative study, offering enrollment consecutively to each RCT participant until September 2019, when thematic saturation was reached. The qualitative study was approved by Sterling Institutional Review Board. For the current analysis, we focused on the sub-sample of Latina adolescents.

**Data Collection**

After providing informed consent, qualitative study participants completed a brief questionnaire that collected demographic, relationship and pregnancy status, contraceptive use experience, and sexual behavior information. Next, the research assistant collected participant contact information and scheduled an interview over the subsequent 14-day period at a time that was both convenient for the participant and one of three interviewers (CH, EGS, GF).

We conducted in-depth telephone interviews in English with participants between May-September 2019. All of the interviewers were female researchers in their early thirties with masters level degrees and prior experience conducting qualitative research, two of whom identified as non-Latina white and one as white Latina; one interviewer was a parent and the other two were not. We used a semi-structured interview guide that asked about the individual's contraceptive knowledge, trusted sources of SRH information, contraceptive and condom use history (including decision-making processes), pregnancy intentions and feelings related to

pregnancy, influencers of contraceptive and condom use and pregnancy intentions (i.e., peers, parents, health care providers), and feelings related to STIs/HIV. Each interview lasted approximately 60 minutes and each participant received a $50 electronic gift card at the conclusion of the interview. Interviews were audio-recorded and transcribed verbatim. Transcripts were imported into Dedoose for coding and analysis.

**Analysis**

We used a grounded theory approach and implemented the constant comparative method for our analysis.[111] CH first examined the text using an open coding process to identify categories of information discussed by the participants and wrote memos to identify dominant themes arising in the data related to Latina adolescent contraceptive decision-making. CH also created a participant-level matrix, which contained key details about each individual that were present in the transcript, including their demographic information, contraceptive use and reproductive history, recent sexual behaviors, and pregnancy intentions. CH and RH met regularly to discuss the coding process and an initial codebook was developed iteratively during this phase. After this first round of coding, 10% of the interviews were randomly selected and GF reviewed the coding of the transcripts. CH and GF met to review discordant codes and arrived at consensus.

We next categorized the initial set of codes into groups (axial codes), each of which defined a potentially influential factor in the contraceptive decision-making process for a Latina adolescent that had arisen from the transcripts. These axial codes were included as separate columns in the participant-level matrix. CH then re-reviewed each transcript, pulling key text from the interviews related to that axial code and saving it in the matrix. The participant-level matrix was used to review axial codes across participant characteristics, assess how multiple factors may be working together or against each other in each individual's decision-making process, identify key recurring themes, and write analytic memos. The analytic memos were reviewed and

discussed during phone calls with the study team to refine the main themes. Finally, we constructed a conceptual model to visualize the relationships between factors that emerged in our analysis.

## RESULTS

### Participant Characteristics

We interviewed 37 self-identified Latina adolescents, most of whom were 19 or 20 years old, had been in college for more than one year, and were living with at least one parent (Table 8). The majority were in a committed relationship and recently sexually active at the time of the interview. Just a little over half were currently using non-barrier contraception, and two individuals had never used non-barrier contraception. Of those who had ever used non-barrier contraception, almost half had tried more than one method, with the pill being the most frequently used method followed by the injection and implant. About two-thirds of the sample had initially started contraception to prevent pregnancy and were currently trying to avoid pregnancy at the time of the interview.

Three main themes emerged describing the complex relationships between interpersonal- and individual-level factors that have the potential to influence Latina adolescent contraceptive decision-making. These relate to the roles of: 1) future ambitions and partner or family influence; 2) pregnancy intentions and fear of contraception; and 3) familial support and positive emotions regarding a pregnancy (Figure 4).

***Theme 1: Future ambitions and partner or family influence appear to compete against each other in the Latina adolescents' decision-making process. Adolescents with future ambitions appear motivated to use more effective non-barrier contraceptive methods, but these convictions may be superseded by heavy partner or family influence.***

When asked about their reasons for using contraception, many of the Latina adolescents described having future ambitions and goals for themselves related to their education, career, or personal well-being. Individuals described wanting to “get my education”, “finish school”, “have a stable job and a stable income” as motivators for their non-barrier contraceptive use. One respondent stated, “The most important factor is me trying to get my career started”, which was a sentiment echoed by several individuals. Respondents specifically mentioned how achieving financial and job stability before having children would be their way to avoid “struggling.” Some of this appeared borne out of lived experiences watching friends or family members (e.g., sisters or cousins) have children at younger ages and encounter financial difficulties.

A closely related idea expressed by many of these same respondents was a desire to prioritize and “take care” or “take charge” of themselves as reasons for using non-barrier contraception. These individuals described wanting to “have more control” over their bodies or their future trajectories because they recognized that they were in the midst of discovering or “figur[ing] out first” who they were before taking on the responsibility of having a child.

Of the respondents who described having future aspirations for themselves related to their reasons for using contraception, most were currently using non-barrier contraceptive methods. Notably, the clarity of their spoken convictions also appeared to correspond, to some degree, with the efficacy of the method being used. For example, when asked about the importance of using contraception, one IUD user stated: “I think it's very important for me, especially because I want to get my nursing degree. So, then it takes so much time to get it, and I feel like if I have a baby at this point, I would just not follow through with my career.” At the conclusion of the interview, each participant was asked what they felt was “the most important factor” influencing their decisions related to contraception. In response to this, three-quarters of those using non-LARC methods identified either “pregnancy prevention” broadly or other individuals as the

primary influencers; whereas the majority of those using LARC extended beyond this and described the role that their personal goals played in the decision-making process. This was perhaps most evident with three individuals who were neither currently sexually active nor had partners at the time of the interview, but who were still using LARC methods because of motivations to finish college. When one of these individuals was asked about her reason for choosing an implant, she said, “I was still finishing up school and, I mean, wasn’t trying to have that [pregnancy] like an issue. And yeah, it felt like it [the implant] was just better for me. I didn’t want kids at the time. Like oh, this is good, four years. It fit me and it sounded good for me.”

While most Latina adolescents who talked about having future ambitions were using non-barrier contraception, some were not using any method. When further explored, these were individuals who also discussed the stronger influences that family or partners have in their decision-making processes. One respondent talked about wanting to focus on herself and do “what I have to do in order to better my future for me and my future family”, but also described how her friend and sister were “against birth control.” Another individual said she “doesn’t want anything happening to myself” and that “at the end of the day, [I] have to look out for myself”, but said related to her sexual health decisions that her boyfriend is “very important when it comes to that. He's the main source, the main reason.” Of those who described being heavily swayed in their contraceptive choices by partners or family members, the majority were either using no contraception or relying infrequently upon condoms alone, even if they simultaneously expressed future goals.

***Theme 2: Latina adolescents may express strong desires to prevent pregnancy and concurrently acknowledge challenges they have with using some non-barrier contraceptive methods consistently. However, fear of non-barrier contraception, in particular LARC methods, stemming from negative individual experiences,***

***misperceptions, or misinformation may inhibit them from selecting more efficacious, user-independent methods.***

Most Latina adolescents with whom we spoke described strong intentions to prevent pregnancy in the immediate future. Reasons they gave included their personal readiness and ability to care for a child, need to complete their education, wish to be more financially sound, and desire to have control over the path of their life. As one respondent said: “Because I have a timeline for my life, as well as included with my partner. So, you know, there's things we want to get accomplished before we begin a family, and I don't want to start a family on an unexpected pregnancy, and I don't want it to throw off what we had – you know, graduate and then move in and then actually start a family like a welcoming way, a happy way.” More than half of the respondents also expressed negative feelings related to pregnancy. Words used to describe how they would feel if they became pregnant at the present moment included “scared”, “inconvenience”, “pissed off”, “disappointed”, “shocked”, “depressed”, “freak out”, and “terrified.”

Close to half of the same individuals who conveyed fervent sentiments to prevent pregnancy also talked about the difficulty they have with using a non-barrier method consistently. Reasons for this included forgetfulness, busyness, and external factors like - shifts in health insurance, not being in the same location every day, or lack of consistent clinic access throughout the year. A few people also talked about their subsequent confusion of not knowing what to do if they missed a day or a week with their method. Several even acknowledged how this inconsistency could increase their risk for a potential pregnancy. For all the current LARC users in our sample, each one mentioned their previous struggles with consistency as their primary motivation to use an IUD or implant, but not one specifically identified the efficacy of the method as their rationale, although efficacy is linked to consistency of use.

Despite having pregnancy prevention intentions, negative perceptions regarding pregnancy, and individual complications with consistency, many of these respondents were currently using non-

LARC methods, which are less efficacious, particularly when not taken on a schedule. When explored, we heard Latina adolescents discuss their fears related to LARC. Almost half of the interviewees mentioned or elaborated on LARC-related fears, describing their apprehension of “internal” methods. For some this emanated from lived experiences. Individuals talked about the adverse side effects they had personally encountered. For example, one current pill user stated: “Because at the time that I had the IUD, I wasn't really in control of my hormones, so because I have chronic migraines, we had to find an alternative birth control that would work with my migraines.” For others, this stemmed from factual knowledge of potential side effects, albeit uncommon, such as the risk of ovarian cysts with the IUD or the possibility of the IUD falling out. A few interviewees also shared examples of friends who had negative LARC experiences: “My friend actually showed me hers [implant] and you can move it around, so it just seems weird. And then my other friend said that she was on her period for the whole time that she had [the implant] in her arm, so she said that she didn't like that. Another friend I heard of also said that […] the implant would move around inside her arm and it moved to a whole different place that it shouldn't have been.”

However, respondents’ fear also stemmed from misperceptions or misinformation they had received about LARC. Examples of misinformation included respondents believing that the IUD was “connected to your ovaries”, that the IUD is placed in the vagina, that the implant would keep moving around and they would “have to keep cutting into me”, that LARC methods were “permanent birth control,” or that it could potentially affect their future fertility. A few said they had “seen scary stuff” or “read a lot of horror stories about them becoming embedded.” On the whole, of fears described, more were related to the IUD and less to the implant.

***Theme 3: Latina adolescents who anticipated receiving both familial support and positive emotions if they were to become pregnant appear less inclined to use more effective contraceptive methods.***

We asked Latina adolescents about what they thought their partners', friends' and families' perceptions of them would be if they became pregnant in the near future and what type of support, if any, they might receive from them. While all individuals who indicated they were in some type of a relationship, whether it be committed, open, or causal, described feeling that their partner would support them with a pregnancy, responses varied when it came to expected familial support. Examples include one individual stating that "My parents would probably cut me off", to the opposite end of the spectrum with another person saying "Oh, God. They'd [my family] be happy. I think I'd have a very supportive family, so yeah. I think they'd be happy."

When exploring these responses vis-à-vis interviewees' current use of non-barrier contraception, we found that equally about half of Latina adolescents not using a method and half of those using LARC described expectations that they would likely receive unequivocal support from their families if they became pregnant. The other half of both groups believed they would either not receive support or receive support that would be accompanied with feelings of "disappointment", "shock", nervousness, judgment, or anger. Some also indicated that the support they would expect to receive wouldn't come from their own or most immediate family, but from the partner's family or distant relatives. However, among the subset of respondents who anticipated that their families would not only provide support, but also express feelings of joy or excitement about them becoming pregnant, only one was using non-barrier contraception, even if they indicated intentions to prevent pregnancy.

### Conceptual Model

Considering the interpersonal- and individual-level factors that emerged in the qualitative data as dominant influences of Latina non-barrier contraceptive use, we created a conceptual framework (Figure 4) to depict their interconnectedness and provide a visual representation of the perceived complexity of the decision-making process.

## DISCUSSION

In this qualitative study exploring how interpersonal- and individual-level factors may interact to influence Latina adolescent contraceptive decision-making and method selection, we found that individuals who described having strong convictions about their personal goals and future were often using more effective non-barrier methods. Those who mentioned substantial familial or partner involvement in their decision-making process were largely using condoms infrequently or no contraceptive method. We also heard Latina adolescents discuss their ardent intentions to prevent pregnancy and the challenges they experience using a non-barrier method consistently, coupled with the fears they have of LARC (e.g., side effects, insertion procedures, fertility concerns). Finally, we observed that Latina adolescents who expect their families to react with positive emotions and also provide support for a pregnancy were principally using condoms alone or no contraceptive method. These findings shed light on some of the complex dynamics that may be involved when Latina adolescent make choices related to non-barrier contraceptive use.

This research supports the idea that factors influencing Latina adolescent contraceptive decision-making are both nuanced and multifaceted,[89] and begins to contextualize some of the intersecting forces involved in that decision. While the effect of partnership characteristics on Latina contraceptive use has been explored,[72,74–76] our findings related to the interplay of future ambitions with partner and family influence are novel. Our data suggest Latina adolescents with

well-articulated, specific aims for their education, career, or financial stability may be inclined to use more effective contraception; this is consistent with goal-setting theory, which posits that the degree of clarity of a particular goal corresponds with performance to achieve that goal.[112] This seems to be driven by their perceptions or observations of how earlier child-bearing may disrupt their ability to achieve personal aspirations and lead to undesired challenges. However, the role that future ambitions may play to motivate effective contraceptive use appears to be superseded by situations where partners or families have a more persuasive influence on the individual. This should be considered alongside our other finding related to the potential combined influence of expected familial financial and emotional support for a near future pregnancy, which suggests that Latina adolescents who perceive themselves as having access to such support systems may be disinclined to use non-barrier contraception, even if they do not have immediate pregnancy intentions. Supporting literature has identified the cultural norms and importance placed on pregnancy and motherhood within Latina communities[113] and the significant role that family has on Latina individuals' reproductive health perspectives[114] as potential explanations for these contraceptive use behaviors. While this has the potential to be perceived as a negative influence, particularly by initiatives aimed at increasing uptake of effective contraception by Latina adolescents, we would strongly discourage this viewpoint. Rather, this highlights the critical need for non-judgmental and affirming research that explores ways in which Latina adolescents may prioritize the perceptions and desires of their family, partners, or communities, perhaps over their own personal goals, and how this relates to their contraceptive decision-making.

Our findings also shed light on the potential power that fear of non-barrier contraception can play in Latina adolescents' contraceptive decision-making. We found that although individuals may have strong desires to prevent pregnancy, they are not always able to use a non-barrier method consistently. Other studies have similarly reported on the disparate relationship

between Latina adolescents' stated pregnancy intentions and actual contraceptive use.[75,115] Our research elaborates on this by highlighting potential explanatory factors –fear of contraception, in particular of LARC. Fear can stem from a variety of realities which Latinas are known to face, including lack of awareness or knowledge of methods,[80] misinformation or misperceptions related to contraception,[83,87] lived negative experiences using contraception,[87] and encounters with race-based reproductive health discrimination or coercion,[28,29,115–117] all of which have the potential to impact contraceptive utilization. Negativity bias describes the psychological tendency to recall adverse information and situations more readily than positive information and provides one possible explanation for Latina adolescents' fear of contraception.[118] Latina adolescents may be more likely to remember health-threatening stories, videos, social media content, or the history of coercive reproductive practices related to contraception, particularly LARC, than the positive aspects of it. For those who fervently want to prevent pregnancy, are aware of their difficulties in using a method consistently, and acknowledge the efficacy of LARC, but also have notable fear of such methods, this could result in a significant mental debate. They are confronted with wanting to prevent pregnancy in an effective way, but internally inhibited in their ability to select a method that may best suit their needs. For the contraception counselor, this highlights the importance of inquiring about, acknowledging, and exploring fears that Latina adolescents may hold related to contraception so that they can begin to be discussed and understood.

While this study enhances our understanding of Latina adolescent contraceptive decision-making, there are limitations. Respondents were recruited from a population of individuals seeking sexual and reproductive health care at eight health centers in California, and thus findings are not necessarily generalizable to all Latina adolescents. Additionally, as this is a qualitative investigation, we are not able to measure the magnitude or statistical significance of the relationships observed between factors and methods used. Despite this, the strengths of

this study are its reliance on interview data collected from a large sample of Latina adolescents, which represent a wide range of contraceptive use choices and allowed us to reach saturation of study themes. All the interviewers were trained female researchers, one of whom was also Latina, with experience conducting qualitative data collection and detailed knowledge of the subject area. We also achieved high concordance during the coding process.

This research highlights opportunities to improve reproductive health services for Latina adolescents. Our recommendations are four-fold. First, in addition to evaluating Latina adolescents' pregnancy intentions, providers should discuss any previous experiences they may have with other methods, particularly if negative, and perceptions or concerns of LARC methods (if they have awareness). This offers a chance to dispel myths and misinformation they may have received and serve as an occasion to investigate and explore how any experiences or fears may affect the individual's contraceptive decision-making. Second, a concerted and non-judgmental effort should be made to explore the individual's reproductive priorities and values. For example, perhaps pregnancy prevention is important, but it could be that they place more emphasis on their relationship with and perspectives of their family. As other literature has highlighted, providers have the potential to empower the individual to make a decision that best meets their needs.[93] Third, in concert with this, providers are encouraged to explore Latina adolescents' perceptions of their family and partner's support for contraception and/or pregnancy to better understand the roles that these may play in their decision-making process. Previous research has found the pregnancy intentions of partners may be as predictive or even more of future pregnancy than Latina adolescents' own pregnancy intentions and has emphasized the importance of assessing this.[81] Finally, reproductive health services for Latina adolescents may benefit from integrating a goal-setting process, in which individuals are walked through a tool or questions that helps them to prioritize what is important for themselves now and in the future. A recent article on goal-setting related to health behavior change advocates

for the role that providers can play in helping individuals to set and achieve their aspirations.[119] A process such as this may clarify or solidify any personal ambitions and help the individual to make reproductive health decisions that support their goals.

Through this research, we have demonstrated ways that patient-centered contraceptive counseling and SRH programs for Latina adolescents can integrate reproductive justice approaches, which are more supportive of dignity, bodily autonomy, agency, and the desires of individuals, particularly those whose fertility has historically been controlled.[32,33] By being both cognizant and responsive to the complex factors that may influence Latina adolescents' contraceptive decisions, reproductive health practitioners and programmers can offer holistic care that simultaneously supports individuals who wish to prevent unwanted pregnancy as well as those who may welcome it.

**ACKNOWLEDEMENTS**

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## TABLES AND FIGURES

### Table 8. Descriptive Characteristics for Interviewees (n = 37)

| Characteristic | n | % |
|---|---|---|
| **Age** | | |
| 18 | 4 | 11% |
| 19 | 17 | 46% |
| 20 | 14 | 38% |
| 21 | 2 | 5% |
| **Ethnicity/race** | | |
| Latina/Latina only | 32 | 86% |
| Latina/Latina with at least one racial category also identified | 5 | 14% |
| **Educational level achieved** | | |
| Less than Grade 12 | 2 | 5% |
| Grade 12/GED | 12 | 32% |
| Associate degree or less than one year of college | 2 | 5% |
| More than one year of college | 21 | 57% |
| **Living situation** | | |
| Lives with both parents | 11 | 30% |
| Lives with single parent | 12 | 32% |
| Lives with relatives | 3 | 8% |
| Lives alone or with friends | 6 | 16% |
| Lives with partner | 5 | 14% |
| **Relationship status** | | |
| Committed relationship with one person | 21 | 57% |
| Casual/open relationship | 4 | 11% |
| Single, trying to meet someone | 3 | 8% |
| Single, not trying to meet someone | 9 | 24% |
| **Sexually active at time of interview** | | |
| Yes | 27 | 73% |
| No | 10 | 27% |
| **Non-barrier contraceptive use** | | |
| Never used | 2 | 5% |
| Used in past | 15 | 41% |
| Currently using | 20 | 54% |
| LARC | 9 | 45% |
| Non-LARC | 11 | 55% |
| **Number of non-barrier methods ever used[1]** | | |
| One method | 20 | 57% |
| Two methods | 9 | 26% |
| Three methods | 6 | 17% |
| **Non-barrier methods ever used[1]** | | |
| Pill | 20 | 57% |
| Patch | 6 | 17% |
| Ring | 3 | 9% |
| Injection | 10 | 29% |
| Implant | 10 | 29% |
| IUD | 4 | 11% |
| Plan B | 2 | 6% |
| **Initial reason for starting non-barrier contraception[2]** | | |
| Control of menstrual-related effects (i.e., acne, cramping, having a routine period) | 5 | 14% |
| Pregnancy prevention | 22 | 63% |
| Pregnancy prevention and control of menstrual-related effects | 8 | 23% |
| **Pregnancy intentions/status** | | |
| Trying to get pregnant or currently pregnant | 4 | 11% |
| Ambivalent | 9 | 24% |
| Trying to avoid pregnancy | 24 | 65% |

[1]Totals do not sum to 37 interviewees and 100% because some participants indicated use of multiple methods.
[2]Category excludes the two participants who had never used contraception.

**Figure 4. Conceptual Model of Factors Influencing Latina Adolescent Contraceptive Decision-Making**

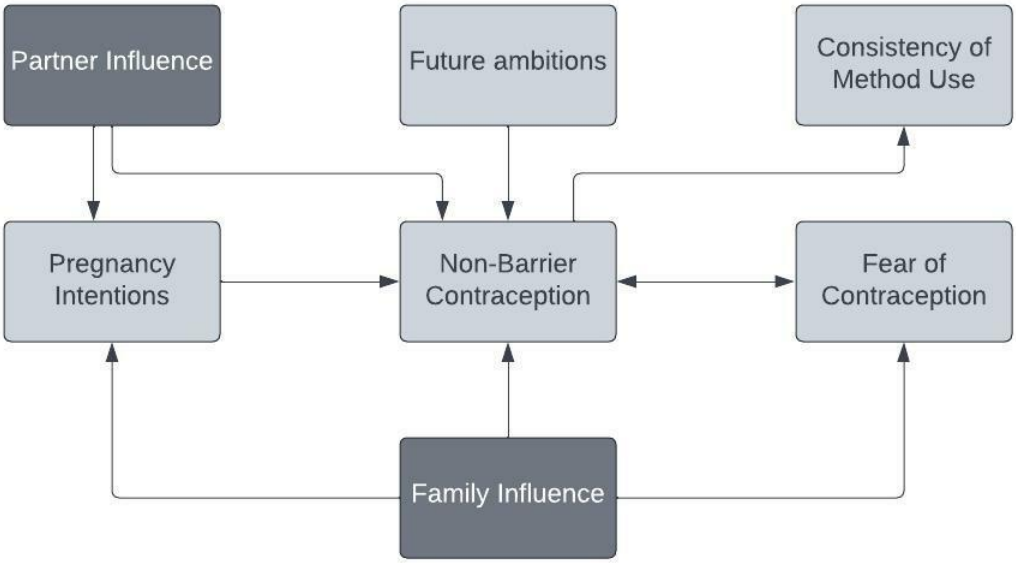


Figure depicts factors that emerged in the qualitative data as influencers of Latina adolescent contraceptive decision-making. Boxes connected with lines that have single-headed arrows indicate one factor that appears to have a unidirectional influence on non-barrier contraceptive use. Boxes connected with lines that have arrows on both ends indicate factors that appear to have a bidirectional influence on each other, meaning that it may influence non-barrier contraceptive use and use of non-barrier contraceptives may influence it. Dark-shaded boxes signify interpersonal-level factors and light-shaded boxes signify individual-level factors.

# CHAPTER 5: CONCLUSION

The work in this dissertation has addressed important questions related to how, when, and why Latina adolescents use non-barrier contraception. Our longitudinal analyses provide a more robust understanding of the temporal dynamics of Latina adolescents' contraceptive use, and suggest that those using non-barrier contraception, in particular more highly effective methods, may be at an increased risk for STIs because of their reduced likelihood to use condoms. This is juxtaposed to our finding that IUDs may offer greater contraceptive stability. Our qualitative analysis builds on this work and offers a deeper understanding of the complex and interconnected factors that play a role in the Latina adolescent's contraceptive decision-making process. Collectively, the findings from this research first provide programmers and health care providers with practical information that can be integrated into patient-centered contraceptive counseling and reproductive health interventions for Latina adolescents that are more responsive their unique needs and desires. Perhaps more importantly though, this research is targeted at policymakers. It contributes to the growing literature emphasizing the importance of reproductive justice-informed approaches. Specifically, it aims to encourage practices that directly acknowledge the injustices and abuses experienced by marginalized groups, are respectful of patients' values, place each individual's personal reproductive health needs and desires first, and use a shared decision-making process to help them arrive at a choice that is responsive to their unique priorities.

## Interpretation and Implications for Future Research

### Enhanced understanding of Latina adolescents' contraceptive use patterns

In Chapter 2, among a cohort of Latina adolescents trying to prevent pregnancy, we report that those using an IUD were most likely to consistently use this method over a nine-month period

compared to users of all other non-barrier methods (implant, pill, patch, ring, injection); interestingly, we also find that those using implants were no more likely to be using this method at the end of that same period than those using all other methods (IUD, pill, patch, ring, injection). This suggests that the IUD may offer the greatest contraceptive stability for Latina adolescents who wish to prevent pregnancy. Related to concerns that LARC methods may inhibit adolescents from being able to change methods as desired due to reliance on removal by providers, our analysis indicates that this did not seem to be a barrier for Latinas in this cohort.

The purpose of this research has been to describe the patterns of Latina adolescents' non-barrier contraceptive use over time. It is *not* to prioritize or promote non-barrier contraception for this particular group, rather to encourage use of evidence-based messaging by those counseling Latina adolescents on contraception options. The language we used to interpret our findings is specific in that it indicates this information should be *provided* to Latina adolescents who do not currently desire pregnancy and are interested in non-barrier contraceptive options, in discussion with all of the other methods available. There have been numerous papers emphasizing the need for caution when discussing LARC methods, particularly when they relate to use by women of color, because of the ways in which they have historically been used to control and manipulate marginalized groups' reproductive health and rights. While LARC offers very efficient and effective contraception, over-promotion of them is a form of coercion, which could serve to restrict an individual's reproductive autonomy.[32–34,120] Our work aims to align with these messages and contribute *knowledge* to the field.

What instigated this research was an appreciable gap in the literature on how, when, and why Latina adolescents use non-barrier contraception. Prior to this, the majority of research focused on analyzing cross-sectional data collected from national surveys, which typically include smaller samples of Latinas, and are not able to explore contraceptive use patterns over time.

We recognized that data derived predominantly from white, non-Hispanic adolescents should not be applied to understand the contraceptive use behaviors of Latina adolescents, notably because the social, cultural, and economic contexts in which they live are often different; it is reasonable to expect that these factors will differentially influence their contraceptive decisions and data supports this idea.[35,36,48] As the SisterSong Collective stated 20 years ago in their statement to raise awareness about the reproductive health and human rights of women of color: “Typically, medical approaches within the U.S. cling to the assumption that there exists a uniform treatment for all people in all cases for a particular health problem…”[103], and “the absence of data on subpopulations of women of color has produced inadequate and sometimes inappropriate policies and programs.”

In Chapter 2, our findings also report on the frequency of non-use, method shifting, and the percentage of Latina adolescents in our cohort who, over a relatively short period of time, discontinued their method. This is similar to other research that has explored contraceptive switching and discontinuation in a racially and ethnically diverse group.[46] It is estimated that around one-third of individuals will stop using a new contraceptive method within the first year.[121] In our work, we found that more than half of the sexually active Latina adolescents were not using a hormonal method or copper IUD at the beginning of the study (51%), and a third (32%) of these same individuals were still not using a method by the end of the nine-month period, despite the majority (82%) of them reporting recent condomless sex. Of those using a non-barrier method at study initiation, almost two-thirds (58%) switched their method over the nine-month period and 14% had stopped using a non-barrier method after just three months. Reasons for method switching and discontinuation are commonly due to method-related side effects or changes in pregnancy intentions. However, we did not have data to explore this in our quantitative work, and it remains unclear whether these are also primary reasons for discontinuation among Latina adolescents.

Future research should quantitively and qualitatively investigate method preferences by Latina adolescents, with the objective being to better support them in their contraceptive decisions and provide them with options that meet their desires and needs. Previous work has pointed to the distinct preferences that Latina women may have for contraceptive attributes, reporting that they want methods where they have greater control over the ability to stop at any time, which do not affect their menstrual cycles, and also protect them from STIs.[94] Future work should build on this to more robustly evaluate why Latina adolescents appear inclined towards less effective methods and why they may frequently shift or discontinue methods. Is it because they are not able to access the contraception that they want? Differential receipt of contraceptive methods has been reported by individuals in diverse racial and ethnic groups, but a more contemporary analysis of this with a nationally representative sample is warranted.[99] Is it that the available methods are not working for them? This would bolster the need for further development of contraceptive methods, in particular non-hormonal ones, that better serve individuals' varying preferences. At a minimum, our findings emphasize the importance of having a wide range of methods available at reproductive health facilities. Or could it be that Latina adolescents have greater contraceptive ambivalence and less interest in the use of more highly effective methods due to varying pregnancy intentions? We discuss this in greater detail below.

**Non-barrier contraceptive use may increase Latina adolescents' risk for STIs, which points to the need for renewed communication about barrier method use**

In Chapter 3, we report that Latina adolescents who were using any type of non-barrier contraceptive method were more likely to engage in condomless sex than those not using hormonal methods or the copper IUD. Among those using non-barrier contraception, Latina adolescents who selected the IUD, implant, or injection were less likely to use dual methods of protection than ring, pill, and patch users. Our findings suggest that Latina adolescents who

choose more highly effective methods may be at an increased risk for STIs, and this should be taken into consideration and addressed during contraceptive counseling.

Recent reports have noted a decline in condom use by adolescents in all racial and ethnic groups.[122] As an example, between 2013 and 2017, the proportion of sexually active Hispanic females who reported using a condom decreased from 51% to 47%. Our research provides important contextual information that may lend itself to better understanding factors influencing this decline in Latinas. It highlights the need for re-emphasizing the importance of communicating about barrier method use during contraceptive counseling for adolescents and is in line with contemporary policy statements. The ACOG's Committee Opinion from 2018 encourages obstetrician-gynecologists to advise adolescents on the use of dual methods,[24] and the AAP released guidance in August 2020 to help pediatricians better understand their role in communicating with adolescents about and supporting them in their use of barrier methods.[123]

Qualitative research has suggested that adolescents may primarily perceive condoms to be a back-up pregnancy prevention method, and have underscored the need to make its STI prevention purposes more salient.[124,125] Coinciding with this is an appreciation that adolescents may use different strategies beyond just condom use to reduce their vulnerability to STIs, and these may vary by race and ethnicity. Strategies may include communication with partners about STI exposure and their other sexual partners, reducing the number of sexual partners, and more frequent STI testing.[104] In our Chapter 3 analysis, we found that approximately 30% of Latina adolescents perceived their risk for HIV/STIs to be high, but these perceptions neither moderated nor mediated the relationship between non-barrier contraceptive use and condomless sex. This association also did not vary in a meaningful way between the 24% of Latina adolescents who had recently been tested for HIV/STIs and the remainder who had not. Taken together, this indicates that for Latina adolescents using non-barrier contraception, their

perceived risk for HIV/STIs and recent testing behaviors may not differentially influence their engagement in condomless sex; these sub-groups were equally as likely to engage in riskier behaviors. Furthermore, this analysis suggests that interventions which simply aim to raise awareness of an individual's risk for STIs may not be sufficient to influence their condom use behaviors. Future research should explore factors that facilitate dual method use by Latina adolescents and whether users of more highly effective methods are truly at an increased risk for acquiring STIs.

**Latina adolescents should have access to medically accurate, factual knowledge about all contraceptive methods to make an informed choice**

In both Chapters 2 and 4, this research highlights the role that contraceptive knowledge may play in Latina adolescents' decision-making. Chapter 2 indicates that within a cohort of Latina adolescents trying to prevent pregnancy, those with lower contraceptive knowledge appeared less inclined to use non-barrier contraception and those with higher contraceptive knowledge were more likely to use their method consistently. In Chapter 4, we learned from Latina adolescents of the ways in which misinformation about contraception may foster fear and inhibit them from using methods that might best serve them. Both studies point to the need for Latina adolescents to have access to medically precise, factual contraceptive knowledge to make informed choices about their reproductive health.

Previous research has shown that disparities in contraceptive knowledge may exist between Hispanic and non-Hispanic white young adults, [80] which could in part be due to a differential provision of family planning services.[100,126] Furthermore, there is evidence that sexual and reproductive health knowledge acquired during adolescence is predictive of protective behaviors in adulthood.[127] Health care providers and reproductive health programmers have a key role they can play in supporting the development of protective behaviors, by providing knowledge

about all contraceptive methods and their potential side effects and taking the time to answer the individual's questions, so that they feel empowered to make an educated choice.[84] Contemporary literature indicates that this type of information-sharing is welcome and desired by Latina adolescents.[78,79]

**Deeper understanding of the role that Latina adolescents' families may play in their contraceptive decision-making**

In Chapter 4, we describe the interconnectedness of factors that may be influential to the Latina adolescents' contraceptive decision-making process. In two of our themes, the role of the family emerged. Previous reproductive health-related research conducted by Latinas has echoed the significance of the family. In a survey of Latina/o individuals in California, when asked who or what influences them most about when or whether to have children, almost half of the individuals wrote in "family" or "parents", and family was ranked as the most important value for individuals personally. "The critical role that family and the community play in seeking care" was identified in their reports as one of three research gaps where data are significantly needed.[114,128]

We learned in our qualitative work the ways in which Latina adolescents' families may influence their decisions related to contraceptive use. In particular, we found that Latina adolescents may be less apt to use non-barrier contraception if they sensed that their families would both provide financial support for a pregnancy and welcome it with positive feelings. Previous literature has pointed to the divergent perceptions of childbearing that may be present in Latina/o communities, describing the significant appreciation for and high value placed on motherhood.[113,114] Recent collaborating evidence has found young Latina individuals to identify more positive feelings towards and benefits from childbearing than their non-Latina white counterparts.[36,86] While the dominant view is that adolescent childbearing is a negative outcome

which should be avoided, our research encourages an alternative perspective – one that considers the differential systems that may be in place to support a younger Latina individual with a child – all of which may influence Latina adolescents' contraceptive behaviors.

We want to extend beyond this idea and highlight one further way in which we see our research contributing to a deeper understanding of Latina adolescent reproductive health. Within the field of public health, adolescent pregnancy has been recognized as a "problem" to fix, in part because it is often characterized as an "unintended" outcome. However, the idea that a pregnancy can and should be *planned* has been proposed as a social construct developed by advantaged groups who have the luxury to approach reproductive health in this way. Some contradictory research suggests that unintended pregnancy may not equally resonate among all racial and ethnic groups and that the term can be stigmatizing.[129–131] The promotion of contraceptives as a key way to help Latina adolescents avoid unintended pregnancy, with the thought that contraception will be a mechanism to help them circumvent potential negative socioeconomic outcomes from adolescent childbearing, ignores the presence of structural racism that has already left them in a disadvantaged status.[45,132] In fact, literature has proposed that adolescent childbearing by groups who are already socioeconomically underprivileged may be perceived as a mechanism to try and build a better future for themselves.[133] Furthermore, there is some evidence that undesired outcomes which may result from adolescent childbearing are not equally experienced by all racial and ethnic groups because of the lower socioeconomic status they experienced even prior to the pregnancy.[19] Our intent in highlighting this perspective within the context of our research is to foster dialogue and prompt the field to reflect on whether the approaches used to reduce disparities in Latina adolescents' reproductive health are consistent with their individual values and priorities.

**Collaborating evidence to promote patient-centered contraceptive counseling and reproductive justice-informed health interventions for Latina adolescents**

In totality, this research proposes ways in which contraceptive counseling and reproductive health interventions for Latina adolescents can offer information on non-barrier method use that is relevant and desired. It suggests that knowledge should be delivered in ways that are attentive to individual values and which prioritize unique goals. The hope is that this work will serve to discourage provider biases during contraceptive counseling, which have been well-documented in the literature.[28,29,116,126,134,135] One analysis has shown that when individuals selected a contraceptive method that they perceived was the providers' preference and not their own, they were more prone to early discontinuation than those who had selected their preferred method.[28] This is just one of many examples demonstrating how reproductive health pressure of any kind may actually constrain health-seeking behavior and have the opposite effect than intended by resulting in an individual not using contraception, even if they desire to prevent pregnancy.[28,116,135] Recent studies among Latina adolescents, which investigate the use of a shared decision-making approach during contraceptive counseling, have indicated that patient-centered, nonjudgmental communication may actually positively influence method consistency.[78] Research indicates that when the full range of contraceptive options is presented and individuals are given sufficient time to deliberate and reflect, they exhibit more reproductive autonomy.[136]

Just four months prior to the publication of this dissertation, ACOG released a Committee Statement entitled "Patient-Centered Contraceptive Counseling", which promotes the use of a shared decision-making process between the patient and provider. Recommendations include the acknowledgement of the historical and present-day reproductive injustices, coercion, and control of marginalized groups, recognition by the provider of their own potential biases, and prioritization of patient values, preferences, and lived experiences.[137] The AAP also recently

shifted away from its former tiered-efficacy approach to one that encourages patient-centered counseling.[25,138] Our work provides collaborating evidence to support and encourage the adoption of reproductive justice-informed practices.

## Conclusion

The three studies included in this dissertation address identified gaps in knowledge related to Latina adolescent reproductive health. They provide a longitudinal description of how a large cohort of Latina adolescents trying to prevent pregnancy used non-barrier contraception, quantify the likelihood of condomless sex among Latina adolescents who chose to use non-barrier contraception relative to those who did not and identify the potentially greater risks associated with particular methods, and explore the complex dynamics involved when a Latina adolescent makes contraceptive decisions. This work highlights opportunities for future research. Specifically, Latina adolescents' contraceptive method preferences should be investigated, with a goal to better understand if their needs and desires are being met and, if not, how this can be fulfilled. Studies should assess the risk of STI acquisition within racially and ethnically diverse adolescent populations using non-barrier contraception and determine if differences exist between groups and contraceptive methods. Finally, there is a need for a much more comprehensive awareness of Latina/o communities' perceptions of and values related to adolescent childbearing to inform the discussion of contraceptive use and adolescent pregnancy. The aim of this research is to offer reproductive health providers, programmers, and policymakers a deeper understanding of and appreciation for Latina adolescents' unique contraceptive use behaviors and decision-making processes, as a means to promote reproductive justice-informed health care that is more attune to their needs and priorities.

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## VITA

Catherine Henley completed her PhD in the Department of Epidemiology at the University of Washington in May 2022. Her research over this time has focused broadly on sexual and reproductive health disparities in the United States, often concentrated on adolescents, and applied research to assess the efficacy of interventions designed to diminish these inequities. Since 2017, she has worked as a Lead Research Analyst at The Policy & Research Group. Prior to completing her doctorate degree, she received a BA in International Affairs at George Washington University, with a focus in International Development, and her MPH in Epidemiology at the University of Washington, with a focus in Global Health. She has lived in Cameroon, and worked in Côte d'Ivoire, Zambia, South Africa, and Mozambique through her positions with the Elizabeth Glaser Pediatric AIDS Foundation and Health Alliance International. In those roles, she contributed to the implementation, evaluation, and research of prevention, care, and treatment programs for people living with HIV and AIDS, in particular pregnant women. Henley was actively involved in the study design, data collection, management, and analysis for the parent quantitative and qualitative datasets, upon which this dissertation work relies. In her current work, she draws from a range of interdisciplinary fields and methods, including surveillance epidemiology, behavioral science, psychology, sociology, causal inference, implementation science, and qualitative research approaches to investigate research questions of interest.