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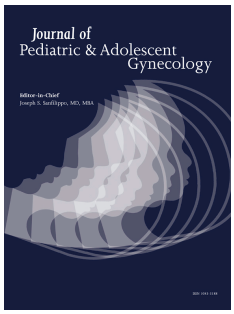

Long Acting Reversible Contraceptive Attitudes and Acceptability in Adolescents and Young Adults (AYA): A Key to Patient-Centered Contraceptive Counseling

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PII: S1083-3188(20)30310-7

DOI: https://doi.org/10.1016/j.jpag.2020.08.013

Reference: PEDADO 2545

To appear in: *Journal of Pediatric and Adolescent Gynecology*

Received Date: 7 April 2020

Revised Date: 11 August 2020

Accepted Date: 20 August 2020

Please cite this article as: Richards MJ, Coleman-Minahan K, Sheeder J, Long Acting Reversible Contraceptive Attitudes and Acceptability in Adolescents and Young Adults (AYA): A Key to Patient-Centered Contraceptive Counseling, *Journal of Pediatric and Adolescent Gynecology* (2020), doi: https://doi.org/10.1016/j.jpag.2020.08.013.

Long Acting Reversible Contraceptive Attitudes and Acceptability in Adolescents and Young Adults (AYA): A Key to Patient-Centered Contraceptive Counseling

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Abbreviations:
LARC: Long Acting Reversible Contraception
IUD: intrauterine device
OCP: oral contraceptive pill
DMPA: depo medroxyacetate progesterone

Word count 4324

Purpose

To examine adolescent and young adults' (AYA) LARC attitudes and assess how attitudes are associated with acceptability.

Design

Survey

Setting

Children's Hospital Colorado Adolescent Family Planning Clinic in Aurora, Colorado.

Participants, Interventions and Main Outcome Measures

Young people ages of 14-24 years presenting for any type of visit between March and August 2018.

Results

We enrolled 332 participants; most (62.3%) had high LARC-acceptability. We found 5 "attitude" factors: 77.7% of the sample endorsed "Effective" attitudes (e.g., wants most effective method), 37.3% endorsed "Good attributes" (e.g., discrete, convenient), 23.1% endorsed "Scary" (e.g., fears device will move), 16.1% endorsed "Bad for health," (e.g., too many side-effects), and 9% endorsed "Not for me" (e.g., concerns about pain). Although participants who endorsed "Effective" (OR 6.60, 95% CI:(3.01-14.49)) and "Good attributes" (OR 3.17, 95% CI: (1.51-6.66)) were more likely to have high LARC acceptability than those who endorsed "Scary" (OR 0.28, 95% CI: (0.13-0.61)) and "Not for me" (OR 0.07, 95% CI: (0.01-0.41)) factors, approximately 10% of participants with high LARC acceptability endorsed "Scary" or "Bad for health" attitudes while 54% of those with low LARC-acceptability endorsed "Effective" attitudes.

Conclusions

Although most participants had high LARC acceptability and valued contraceptive effectiveness, the association between LARC attitudes and acceptability is nuanced. Providers should identify and discuss young people's contraceptive knowledge, attitudes, and acceptability.

Keywords: Adolescent, LARC (Long Acting Reversible Contraception), Attitudes, Acceptability, Misconceptions, Myths

Implications and Contributions

Young people have complex attitudes about contraception. They can desire effectiveness and convenience and also have fears about safety and side effects. Providers can provide patient-centered counseling by eliciting preferences, providing accurate knowledge, and addressing patient concerns.

Introduction

Contraceptive use among young people is influenced by multiple factors, including access to care, confidentiality, and affordability [1–3]. Knowledge and attitudes about contraception also play an important role in method preference, initiation, continuation, and satisfaction [4,5]. Prior research suggests that many young people have gaps in their contraceptive knowledge [6,7] and there are often more misconceptions around long-acting reversible contraception (LARC) methods than other contraceptive methods, among both women [1] and healthcare providers [8,9]. Young people have lower contraceptive knowledge than adults [6] and they may hold misconceptions or overestimate risks associated with LARC methods, including concerns with devices moving in their bodies [1], and infertility [1,10–13]. Despite low knowledge and misconceptions, evidence suggests many young people have positive attitudes toward LARC and value privacy, convenience, and effectiveness [10,14,15]. Most studies focus on misconceptions or negative attitudes toward LARC and few studies have comprehensively described and quantified individual misconceptions and both negative and positive attitudes.

Some scholars suggest young people with low knowledge and misconceptions about contraception find LARCs to be unacceptable methods [1,12]. Yet given that all contraceptive methods have risks and benefits, it stands to reason that young people may have both negative and positive attitudes about LARC. The relationship between attitudes and method acceptability may be nuanced;

negative attitudes or misconceptions may not render the method unacceptable, and positive attitudes may not mean the method is acceptable for them. However, there is limited data on the association between attitudes about LARC and method acceptability, particularly among LARC users. Prior research on attitudes and acceptability has focused primarily on LARC never users [7,16,17] and although studies have evaluated satisfaction and continuation among LARC users, few have evaluated concerns or misconceptions among LARC users [18]; unresolved concerns about a chosen method could lead to decreased satisfaction and continuation.

Contraceptive method acceptability is an underutilized but important measure of young people's contraceptive preferences. Most studies focus on contraceptive use, but use is heavily influenced by access to contraception. Method acceptability is also patient-centered as our goal as clinicians and public health experts has moved from increasing LARC use among young people to increasing the number of young people who can choose and use the contraceptive method that best suits their family planning goals and method priorities. Our aim is to improve contraceptive counseling for young people by focusing on individual attitudes and acceptability to help them choose a method that works best for them. In this study, we describe and categorize LARC attitudes and misconceptions using factor analysis, examine LARC acceptability, and evaluate how LARC attitudes and misconceptions are associated with acceptability of LARC methods among young people who have ever or never used LARC.

Materials and Methods

Sample & procedures

We conducted a cross-sectional survey of patients seeking care at BC4U, an AYA-oriented, urban, Title X-supported family planning clinic in Colorado that offers free and confidential reproductive health services to young people under 25 years of age. This clinic serves approximately 4,000 young

people a year. All female English-speaking patients between ages of 14-24 years presenting for any type of visit at BC4U between March and August 2018 were eligible to participate. This study was approved by the authors' Institutional Review Board.

Patients were given a self-administered paper questionnaire by the principal investigator or research assistant before seeing a provider. No incentives were received for participation. Data were excluded if the patient did not complete the survey, declined participation, or took the survey home. The most common reason for declining participation was lack of time. A consent form at the beginning of the survey explained study participation was voluntary and that taking the survey verified consent or assent. A waiver of parental consent allowed patients aged 14–17 years to assent to participation. After completing the survey, the participant was seen by a clinic provider as per the standard of care. Survey data were entered into REDCap software by trained research assistants [19].

Measures

We developed an original survey based on prior literature [2,7,16,20] that assessed LARC attitudes, misconceptions, and acceptability, as well as contraceptive history, pregnancy goals, and demographic characteristics. This survey was piloted on approximately 15 females of diverse race and ethnicity in the clinical setting for readability and understanding and revised accordingly.

LARC attitudes and misconceptions.

The survey contained 27 statements (16 “negative” and 11 “positive”) that participants ranked on a five-point Likert scale from strongly agree to strongly disagree. There were three types of negative items: (1) Negative attitudes, such as fear of painful insertion, dislike of a foreign object in body, or fear of side effects; (2) Misconceptions, including concerns about infertility or overestimation of risks, such as an implant or IUD moving, breaking, or expelling; and (3) Method priorities less compatible with LARC

methods, such as not needing a method that works all the time or that three to ten years is too long to commit to a method. Positive statements included positive attitudes toward LARC, such as LARCs are effective, long-term, discreet and/or convenient. The full survey can be accessed: https://redcap.ucdenver.edu/surveys/?s=KET7RP7CDX

LARC acceptability.

We assessed participants' personal acceptability of the IUD and the implant with two questions developed by Whitaker and colleagues [21,22], "On a scale from 0 to 10, how much do you like the idea of using an IUD for yourself?" and "On a scale from 0 to 10,how much do you like the idea of using an implant for yourself?" Although the authors described this as "attitudes," we use the term, "personal acceptability" to represent an attitude toward the method as well as acceptability of using it oneself [16]. Using these two questions, we created a categorical variable for method acceptability: Low personal acceptability was categorized as a score of 0–3 for *both* the IUD or implant; moderate acceptability was categorized as *either* IUD or implant rated as 4-7 (but neither was rated higher); and high personal acceptability was categorized as a score of 8–10 for *both or either* the IUD or implant.

Independent variables/covariates

We created a series of dichotomous variables (yes/no) to assess contraceptive methods ever used (including current use) because participants could have started and discontinued more than one method in the past. We created a categorical variable to capture current contraceptive use (IUD, implant, depot medroxyprogestone acetate (DMPA), oral contraceptive pills (OCPs), vaginal ring, contraceptive patch, condoms, none). We additionally created dichotomous variables for ever used and currently using a LARC method. Participants were asked when they wanted to get pregnant (now/soon, in next year, 1-2 years, 2-5 years, >5 years, never, I don't know) and how they would feel if they got pregnant in the next 6 months (really excited, a little excited, partly excited and partly upset, a little

upset, really upset). Demographic data was abstracted from the electronic medical record including age (continuous years) and race/ethnicity (non-Hispanic White, non-Hispanic Black, Non-Hispanic Other, Hispanic).

Analysis

We first calculated frequencies and proportions for each item measuring LARC misconceptions and attitudes, LARC acceptability, and covariates. We then performed a factor analysis on the 27 LARC attitude items. Principal axis factor analyses (oblique rotation) and reliability tests were used to identify and evaluate possible factors. As we had no a priori basis for weighting the scale items, they were all assigned equal value and scale scores were obtained by summing the proportion of items to which participants strongly agreed or agreed with each statement. We considered a positive endorsement of a factor if a participant strongly agreed or agreed with ≥60% of items in that factor.

Next, we examined contraceptive method use and demographic characteristics by LARC acceptability using chi-squared or ANOVA. We also examined LARC attitude factors by LARC acceptability using ANOVA with a linear trend. Finally, we identified predictors of high LARC acceptability using logistic regression. Statistically significant ($p<0.1$) demographic and reproductive health variables were entered in the first step and the factor variables were entered into the second step and forced into the model.

Results

Descriptive statistics

A total of 332 participants completed the survey. The sample had a median age of 20 years and was racially and ethnically diverse (Table 1). Over 90% of participants reported currently using a method of birth control with 37% using an implant, 17% an IUD, 15% DMPA, and 14% OCPs; 54% of participants

were currently using a LARC method. Approximately half of participants ever used the implant, 22% an IUD, 26% DMPA, and 46% OCPs; 63% had ever used LARC.

The majority of participants (63%) reported wanting to avoid pregnancy for at least two years; less than 5% desired pregnancy with the next year and 19% were unsure about when they wanted to become pregnant. Fifty-five percent of the sample reported they would feel upset if they got pregnant in the next six months, 30% would be "partly excited and partly upset", and 15% reported they would be excited.

Factor analysis

Factor analysis yielded a 5-factor solution with factor loadings >0.4 for all items (Table 2). Based on the definitions of items contained in each factor, the factors were subsequently labeled: Effective (4 items; Cronbach α = 0.69), Good attributes (6 items; Cronbach α = 0.76), Scary (7 items; Cronbach α =0.86), Bad for health (3 items; Cronbach α = 0.67), and Not for me (5 items; Cronbach α = 0.68). Two statements: "It would be nice to not have a period" and "If I had birth control inside of me (like the implant or IUD) I would be worried I wouldn't be able to find a provider to take it out when I want" did not load onto any other factors. All five subscales exhibited stable factor patterns and had acceptable reliability.

The most commonly endorsed LARC attitude factors were positive: 77.7% endorsed the "Effective" factor and 37.3% endorsed "Good attributes." Lower proportions of participants endorsed negative factors of LARC: 23.1% endorsed "Scary" and 16.1% endorsed "Bad for health." Approximately 9% of participants endorsed the factor "Not for me."

The "Effective" factor included three items related to effectiveness and not having to think about a method, including the two most frequently endorsed of all 27 items, wanting the most effective method of birth control (84%) and wanting a method they don't have to think about (84%). The "Good Attributes" factor included items like convenience (80%), having effective, long-term birth control (71%),

ease of removal (68%), privacy (47%), and a number of health benefits. The "Scary" factor included misconceptions and negative attitudes about a foreign body; almost half of participants (49%) worried about LARC moving and 42% worried about it breaking. Approximately one-third of participants endorsed concerns related to fertility, expulsion, or being uncomfortable with a foreign-body. The "Bad for Health" factor included concerns about side effects (24%), amenorrhea (22%), and hormones (19%). Finally, the "Not for me" factor included concerns about LARC negatively affecting their sex life (28%) or causing pain (23%). Although they did not load onto any of the factors, it is important to note that 65% of participants agreed "it would be nice to not have a period," and more than one in five participants worried they "wouldn't be able to find a provider to take it out."

LARC Acceptability

There were no significant differences in LARC acceptability for age or race/ethnicity (Table 3). Participants who were ever or current users of LARC were significantly more likely to have high LARC acceptability than those who had never used. Examining individual LARC methods, participants who were ever or current users of an implant were significantly more likely to have high LARC acceptability than those who had never used an implant or were not currently using an implant ($p=0.03$, $p<0.001$ respectively). Current IUD users were also more likely to have high LARC acceptability than participants not currently using an IUD ($p<0.001$), but the same was not true of ever users of the IUD. Participants who reported ever using the IUD were more likely to have moderate or low LARC acceptability compared to those who never used an IUD ($p=0.02$). Participants who were ever or current users of DMPA were significantly more likely to have low LARC acceptability than those who are not currently or never used DMPA ($p<0.001$). Participants currently using OCPs were more likely to have low rather than high LARC acceptability ($p<0.001$). There were no significant differences in LARC acceptability among participants who were ever users of OCPs, the ring or the patch. LARC acceptability did not differ by

pregnancy intentions. Greater LARC acceptability was associated with being upset about becoming pregnant in the next six months (p=.06).

Participants with high LARC acceptability were more likely to endorse the "Effective" factor than participants with moderate or low acceptability (89% vs. 68% vs. 54% respectively) (Figure 1). Participants with high acceptability were also more likely to endorse factor of "Good attributes" than those with moderate or low acceptability (52% vs. 21% vs. 6% respectively). Participants with low acceptability were significantly more likely to endorse negative factors such as "Scary" (57% vs. 32% vs. 10% respectively) and "Bad for Health" (36% vs. 13% vs. 11% respectively) than those with moderate or high acceptability.

In logistic regression the independent predictors of having high LARC acceptability were currently using a LARC (OR 4.34, 95% CI: (2.24-8.85)) and endorsing factors of "Effective" (OR 6.60, 95% CI: (3.01-14.49)) and "Good attributes" (OR 3.17, 95% CI: (1.51-6.66)) (Table 4). Factors associated with lower odds of high acceptability were "Scary" (OR 0.28, 95% CI: (0.13-0.61), "Bad for Health" (OR 0.40, 95% CI: (0.15-1.03) and "Not for me" (OR 0.07, 95% CI: (0.01-0.41)).

Conclusion

Understanding young people's contraceptive attitudes, acceptability, and priorities can help providers provide patient-centered contraceptive counseling. By highlighting nuance in the association between LARC attitudes and acceptability, we found young people could have positive LARC attitudes and find LARC unacceptable or could have negative LARC attitudes, such as misconceptions about the method, and find LARC acceptable. Based on these findings, we offer immediately useful recommendations on contraceptive counseling. Providers should elicit young people's attitudes and misconceptions, as well as method acceptability to provide evidence-based information while encouraging autonomy. Providers should additionally assess method satisfaction and concerns or fears that developed after method initiation to increase satisfaction and continuation or to offer method

removal if the patient desires. These recommendations can be incorporated into clinicians' current contraceptive counseling practices and provider training.

We found five concepts that emerged from participant responses; two positive (Effective and Good attributes) and three negative (Scary, Bad for health, and Not for me). The positive factors were endorsed by many participants. Prior studies have similarly found that young women interested in LARC value the methods' discreetness, effectiveness, and convenience [5,9,23,24]. On the other hand, almost a quarter of participants endorsed the "Scary" factor and 16% "Bad for Health". This, also, is consistent with prior studies that describe fears and health concerns AYA have about LARC methods [7,11,12,14,15].

Overall, LARC acceptability is high in our sample and higher than acceptability found in other studies [10,16]. There are a number of possible reasons for this difference. First, we considered high LARC acceptability as high acceptability for either the IUD or the implant whereas other studies examined acceptability separately for IUDs and implants [10,16]. Second, our sample included a higher proportion of participants who had ever used a LARC method as most other studies have focused on never users [15,16]. Third, our study took place in Colorado which has benefited from the Colorado Family Planning Initiative (CFPI) [25]. Between 2009 and 2015, CFPI provided free LARC methods throughout the state and was accompanied by a media campaign that likely increased awareness and use of LARC. Indeed, a study with an earlier cohort from our clinic found high awareness of LARC methods and 80% of patients who chose an IUD or implant reported they wanted the method prior to the visit [16]. Finally, IUD and implant awareness and use of LARC have also grown nationally since prior research was conducted [26].

Our finding that LARC acceptability did not differ by age or race/ethnicity aligns with Bachorik et al. [10,27] who found race/ethnicity was not associated with young people's attitudes toward implants and Marshall et al. who found no race/ethnic differences in young women's preferences for

contraceptive attributes. [27] However, these results should be interpreted within the context of systemic and structural racism, specifically a long history of reproductive coercion among race/ethnic minorities in the U.S.[28] Although data on contraceptive attitudes by race/ethnicity among young people is fairly limited, attitudes among adult women reflect this racist history: Black and Latina women are more likely than white women to believe "the government uses birth control as a tool to limit minority populations"[4] and other studies suggest Black and Latina women place greater importance on being able to control initiating or stopping a method,[29,30] rather than depending on a provider. Moreover, public health and medical recommendations to reduce unintended and adolescent pregnancy by increasing LARC use has led to concerns about providers "pushing" LARC on low-income young people of color.[31,32] Regardless of the lack of difference in LARC acceptability by race/ethnicity in our study, providers must consider the context of systemic and structural racism and their own biases to provide equitable contraceptive care that supports young people's autonomy.

Advancing prior research that has left out current or ever LARC users, findings of the present study suggest participants with high LARC acceptability were more likely to have ever used or be currently using LARC than those with moderate or low acceptability. This supports studies that show relatively high satisfaction rates with LARC [33]. Young people who have experience with LARC methods, on average, appear to find them more acceptable. Likewise, never users do not have personal experience to draw from, which may lower their acceptability especially if social influences have been negative [34]. Indeed, Bracken, et al [15] found that LARC never users were significantly more likely to report negative attitudes about LARC use than ever users.

However, acceptance of a method does not guarantee method satisfaction; 19% of participants with low acceptability were currently using LARC. These LARC users could be dissatisfied with their method or have unresolved concerns or side effects. Most prior studies on LARC attitudes have focused on never users [5,10,15] and have not identified unresolved fears such as risks of a foreign body or

fertility concerns in people currently using LARC, although there is evidence that even those who value their LARC method may still have concerns about health risks, including infertility [18]. Patients could have these concerns prior to method selection, or they could develop these concerns during method use due to side effects or new information obtained from their social network. Our clinically relevant findings suggest that in addition to eliciting patients' contraceptive attitudes and concerns so they can choose the method best for them, providers should assess method satisfaction, including inquiring about and addressing concerns or fears at subsequent visits— to reduce or eliminate these fears and improve satisfaction, or to offer method removal.

LARC acceptability did not vary by pregnancy intentions but being upset about a pregnancy in the next six months was associated with greater LARC acceptability. This discordance between pregnancy intentions and feelings about pregnancy suggest pregnancy preferences are complex and support Rocca and colleagues' [4] identification of three domains of the desire to avoid pregnancy: cognitive desire, affective feelings, and practical consequences. Clinically, pregnancy intentions may warrant a discussion, rather than a single question and future research with young people should examine pregnancy preferences using multiple domains, rather than a single question.

Endorsement of the "Effectiveness" factor or "Good attributes" factor was associated with high LARC acceptability. However, some participants valued effectiveness or other "Good attributes" and still did not find LARC acceptable. Valuing effectiveness does not necessarily correlate with choosing LARC methods [27,35] and young people consider other attributes when selecting a method [36]. Although over eighty percent of our participants reported they wanted the most effective method of birth control, only half were currently using a LARC. AYA may feel that short-acting methods (SARC) are effective methods for them and/or they may have attitudes or preferences not compatible with LARC that outweigh their concern about SARC effectiveness, such as having a monthly period or having a method that is not provider dependent [37]. Low acceptability may also reflect past negative

experiences with LARC. By including ever users, we found that 86% of participants with low LARC acceptability had ever used an IUD and 40% had ever used an implant. These participants may have had LARC removed due to negative experiences that ultimately reduced LARC acceptability.

Participants who endorsed the "Scary" and "Bad for health" factors had lower odds of having high LARC acceptability than participants who did not endorse those factors. This aligns with previous qualitative and quantitative studies that have found disinterest in LARC is associated with fears of expulsion [12] and misplacement or migration [12] as well as dislike of foreign bodies [7,12,15], misconceptions about infertility [11,15], and about health risks of amenorrhea [11].

The association between method acceptability and contraceptive attributes was not always linear. Ten percent of participants with high LARC acceptability endorsed the "Scary" or "Bad for Health" factors and a similar percentage of participants with low LARC acceptability endorsed "Good attributes". Young people who find LARC acceptable (and may ultimately choose a LARC) may still have fears and concerns and those who find a LARC unacceptable may still value many attributes associated with a long acting method. This reflects the complexity of contraceptive decision making in adolescents and young adults. Young people who choose to initiate LARC may devalue certain concerns because of the high value they place on effectiveness, convenience, or privacy whereas other teens may acknowledge some of these benefits but feel they are far outweighed by concerns (related to health or side effects), fears or alternative preferences. If the goal is for patients to choose and continue the best method for them, it is similarly important for providers to elicit patients' concerns and fears even if a patient finds a method acceptable. Indeed, high quality counseling that includes information about side effects has been associated with method continuation [38], so ensuring patients have accurate knowledge is equally important for method selection as it is for method continuation. Future research using longitudinal data can evaluate how counseling practices focused on individual patient preferences,

attitudes and concerns influence satisfaction with counseling, method initiation, and method satisfaction specifically among young people.

Study strengths include a race/ethnically diverse sample of young people. Limitations include recruitment from a single Title X supported clinic and recruitment of only English-speaking patients; results may not be generalizable to young people in other settings, who prefer a language other than English, or who identify as transmen or non-binary. Although we pilot tested the survey, some participants may misinterpret some of the more abstract questions or statements, such as "having something inside me is kind of cool." This was also a newly created non-validated survey. We chose to create this survey including some items from prior research as, to our knowledge, there are no validated surveys that exist about this topic. Our factor analysis included questions that did not specifically refer to IUDs or implants or referred to both or one or the other. Similarly, we measured LARC acceptability as a whole, rather than implant or IUD acceptability.

It is important that patients have accurate knowledge on which to base their preferences because myths and misconceptions may be the reason patients avoid an otherwise acceptable method [11,14]. Study findings can be incorporated into contraceptive counseling training. Even if a young person finds LARC acceptable, providers should still identify and address attitudes, concerns, and the root of patient fears which often stems from social influences including social media, peer and family influences [34]. However, providing patients with accurate information and dispelling myths may not change patient preferences or allay their fears and providers must respect patient autonomy and method choice independent of patients' reasons. Moreover, the complexity in attitudes and acceptability found in our study reinforce the need for providers to continuously assess method satisfaction and concerns or fears that may have developed with method use to improve method continuation, ensure young people are satisfied with the method they chose, or to support patient autonomy and offer method removal.

Acknowledgments: The authors wish to acknowledge the staff of the BC4U clinic for their dedication to providing high quality reproductive health care to adolescents and young adults, and the participants themselves.

The authors have no conflict of interests.

References

[1] Sundstrom B, Baker-Whitcomb A, DeMaria AL. A Qualitative Analysis of Long-Acting Reversible Contraception. Matern Child Health J 2015;19:1507–14.

[2] Pritt NM, Norris AH, Berlan ED. Barriers and Facilitators to Adolescents' Use of Long-Acting Reversible Contraceptives. J Pediatr Adolesc Gynecol 2017;30:18–22.

[3] Coles CB, Shubkin CD. Effective, recommended, underutilized: A review of the literature on barriers to adolescent usage of long-acting reversible contraceptive methods. Curr Opin Pediatr 2018;30:683–8.

[4] Rocca CH, Harper CC. Do Racial and Ethnic Differences in Contraceptive Attitudes and Knowledge Explain Disparities In Method Use? Perspect Sex Reprod Health 2012;44:150–8.

[5] Gomez AM, Hartofelis EC, Finlayson S, et al. Do Knowledge and Attitudes Regarding Intrauterine Devices Predict Interest in Their Use? Women's Heal Issues 2015;25:359–65.

[6] Craig AD, Dehlendorf C, Borrero S, et al. Exploring young adults' contraceptive knowledge and attitudes: Disparities by race/ethnicity and age. Women's Heal Issues 2014;24.

[7] Hall KS, Ela E, Zochowski MK, et al. "I don't know enough to feel comfortable using them:" Women's knowledge of and perceived barriers to long-acting reversible contraceptives on a college campus. Contraception 2016;93:556–64.

[8] Coleman-Minahan K, Dillaway CH, Canfield C, et al. Low-Income Texas Women's Experiences Accessing Their Desired Contraceptive Method at the First Postpartum Visit HHS Public Access. Perspect Sex Reprod Heal 2018;50:189–98.

[9] Okpo E, Allerton L, Brechin S. "But you can't reverse a hysterectomy!" Perceptions of long acting reversible contraception (LARC) among young women aged 16-24 years: A qualitative study. Public Health 2014;128:934–9.

[10] Bachorik A, Friedman J, Fox A, et al. Adolescent and Young Adult Women's Knowledge of and Attitudes Toward Etonogestrel Implants. J Pediatr Adolesc Gynecol 2015;28:229–33.

[11] Payne JB, Sundstrom B, DeMaria AL. A Qualitative Study of Young Women's Beliefs About Intrauterine Devices: Fear of Infertility. J Midwifery Women's Heal 2016;61:482–8.

[12] Potter J, Rubin SE, Sherman P. Fear of intrauterine contraception among adolescents in New York City. Contraception 2014;89:446–50.

[13] Gilliam ML, Warden M, Goldstein C, et al. Concerns about contraceptive side effects among young Latinas: A focus-group approach. Contraception 2004;70:299–305.

[14] Gomez AM, Freihart B. Motivations for Interest, Disinterest and Uncertainty in Intrauterine

Device Use Among Young Women. Matern Child Health J 2017;21:1753–62.

[15] Bracken J, Graham CA. Young women's attitudes towards, and experiences of, long-acting reversible contraceptives. Eur J Contracept Reprod Heal Care 2014;19:276–84.

[16] Cohen R, Sheeder J, Kane M, et al. Factors Associated With Contraceptive Method Choice and Initiation in Adolescents and Young Women. J Adolesc Heal 2017;61:454–60.

[17] Hubacher D, Spector H, Monteith C, et al. Not seeking yet trying long-acting reversible contraception: a 24-month randomized trial on continuation, unintended pregnancy and satisfaction. Contraception 2018;97:524–32.

[18] Murphy MK, Burke PJ, Haider S. A Qualitative Application of Diffusion of Innovations to Adolescents' Perceptions of Long-Acting Reversible Contraception's Attributes. J Pediatr Adolesc Gynecol 2017;30:484–90.

[19] Harris PA, Taylor R, Thielke R, et al. NIH Public Access Author Manuscript J Biomed Inform. Author manuscript; available in PMC 2010 April 1. Published in final edited form as: J Biomed Inform. 2009 April ; 42(2): 377–381. doi:10.1016/j.jbi.2008.08.010. Research Electronic Data Capture (REDCap. J Biomed Inf 2009;42:377–81.

[20] Russo JA, Miller E, Gold MA. Myths and misconceptions about long-acting reversible contraception (LARC). J Adolesc Heal 2013;52:S14–21.

[21] Whitaker AK, Dude AM, Neustadt A, et al. Correlates of use of long-acting reversible methods of contraception among adolescent and young adult women. Contraception 2010;81:299–303.

[22] Whitaker AK, Johnson LM, Harwood B, et al. Adolescent and young adult women's knowledge of and attitudes toward the intrauterine device. Contraception 2008;78:211–7.

[23] Gomez AM, Clark JB. The Relationship Between Contraceptive Features Preferred by Young Women and Interest in IUDs: An Exploratory Analysis. Perspect Sex Reprod Health 2014;46:157–63.

[24] Schmidt EO, James A, Curran KM, et al. Adolescent Experiences with IUDs: a Qualitative Study HHS Public Access. J Adolesc Heal 2015;57:381–6.

[25] Colorado Department of Public Health and Environment. Taking the Unintended Out of Pregnancy: Colorado's Success with Long-Acting Reversible Contraception. 2017.

[26] Kavanaugh ML, Jerman J. Contraceptive method use in the United States: trends and characteristics between 2008, 2012 and 2014. Contraception 2018;97:14–21.

[27] Marshall C, Guendelman S, Mauldon J, et al. Young Women's Contraceptive Decision Making: Do Preferences for Contraceptive Attributes Align with Method Choice? Perspect Sex Reprod Health

2016;48:119–27.

[28] Reproductive Justice by Loretta Ross, Rickie Solinger - Paperback - University of California Press. Available at: https://www.ucpress.edu/book/9780520288201/reproductive-justice. AccessedJuly 27, 2020.

[29] Jackson A V, Karasek D, Dehlendorf C, et al. Racial and ethnic differences in women's preferences for features of contraceptive methods 2015.

[30] Gomez AM, Mann ES, Torres V. 'It would have control over me instead of me having control': intrauterine devices and the meaning of reproductive freedom. Crit Public Health 2018;28:190–200.

[31] Gomez AM, Fuentes L, Allina A. Women or LARC First? Reproductive Autonomy And the Promotion of Long-Acting Reversible Contraceptive Methods. Perspect Sex Reprod Health 2014;46:171–5.

[32] Gubrium AC, Mann ES, Borrero S, et al. Realizing reproductive health equity needs more than Long-Acting Reversible Contraception (LARC). Am J Public Health 2016;106:18–9.

[33] Rosenstock JR, Peipert JF, Madden T, et al. Continuation of reversible contraception in teenagers and young women. Obstet Gynecol 2012;120:1298–305.

[34] Yee L, Simon M. The role of the social network in contraceptive decision-making among young, African American and Latina Women. J Adolesc Heal 2010;47:374–80.

[35] Walker AW, Stern L, Cipres D, et al. Do Adolescent Women's Contraceptive Preferences Predict Method Use and Satisfaction? A Survey of Northern California Family Planning Clients. J Adolesc Heal 2019;64:640–7.

[36] Marshall C, Kandahari N, Raine-Bennett T. Exploring young women's decisional needs for contraceptive method choice: a qualitative study. Contraception 2018;97:243–8.

[37] Egarter C, Frey Tirri B, Bitzer J, et al. Women's perceptions and reasons for choosing the pill, patch, or ring in the CHOICE study: A cross-sectional survey of contraceptive method selection after counseling. BMC Womens Health 2013;13.

[38] Dehlendorf C, Henderson JT, Vittinghoff E, et al. Association of the quality of interpersonal care during family planning counseling with contraceptive use. Am J Obstet Gynecol 2016;215:78.e1-78.e9.

Acknowledgments:

Table 1. Sample characteristics

Characteristic (N=337)	Median (range) or %
Age (years)	20 (14-24)
Race/Ethnicity	
Non-Hispanic White	29.4%
Non-Hispanic Black	9.0%
Non-Hispanic Other	15.9%
Hispanic	45.6%
Methods used ever (including currently):	
IUD	22.0%
Implant	50.7%
DMPA	25.5%
OCPs	46.0%
Vaginal ring	6.5%
Contraceptive patch	1.5%
Ever used LARC	62.6%
Current method:	
IUD	17.1%
Implant	37.3%
DMPA	15.1%
OCPs	13.7%
Vaginal ring	2.7%
Contraceptive patch	0.3%
Condoms	4.5%
None	9.2%
Currently using LARC	54.4%
When do you think you want to get pregnant?	
Now/soon	1.3%
In the next year	2.3%
1-2 years	4.7%
2-5 years	27.0%
>5 years	35.7%
Never	10.0%
I don't know	19.0%
How would you feel if you got pregnant in the next 6 months?	
Really excited	5.6%
A little excited	9.6%
Partly excited and partly upset	29.7%
A little upset	12.2%
Really upset	42.9%
LARC acceptability:	
Low (on both IUDs and implants)	19.0%
Moderate	18.7%
High (on IUD and/or implant)	62.3%

Table 2. Factor analyses

Factor and items	% who Agree or Strongly Agree	Factor loading	Cronbach's alpha
Effective	**77.7%**		0.69
I want the most effective method of birth control.	83.8%	0.68	
It would be great to have a method I don't have to think about every day.	83.5%	0.76	
I don't want to have to think about my birth control, I just want to be protected.	76.1%	0.67	
Good attributes	**37.3%**		0.76
I think birth control methods like the implant or IUD are good because they are already working if you decide to have sex.	80.1%	0.61	
Having an effective, long-term birth control method (like the implant or IUD) allows me to plan my future.	71.0%	0.51	
I think birth control methods like implants and IUDs are great because you can get it out whenever you want.	67.7%	0.49	
I like the idea of the implant or IUD because they have lower doses and less side effects.	57.7%	0.51	
It would be nice to have birth control inside of me because no one else would know I'm using it.	46.6%	0.66	
Having something inside of me (like the implant or IUD) is kind of cool.	19.6%	0.62	
I think birth control methods like the implant or IUD can be good for your health.	17.6%	0.65	
Scary	**23.1%***		0.86
If I had birth control inside of me (like the implant or IUD), I would be worried it might move around my body and get lost and/or need surgery to remove.	48.8%	0.81	
If I had birth control inside of me (like the implant or IUD), I would be worried it might break and cause problems that would be bad for my health.	41.9%	0.76	
If I had birth control inside of me (like the implant or IUD), I would be worried it might cause problems with my fertility (ability to have children in the future).	39.8%	0.57	
If I had birth control inside of me (like the implant or IUD), I would be worried it could come out.	33.3%	0.79	
Having something inside of me (like the implant or IUD) is scary.	32.7%	0.62	
I think that using any birth control method for too long can cause problems with fertility (having children in the future).	33.2%	0.49	
I just don't like the idea of having something inside me.	24.3%	0.51	

Factor and items	% who Agree or Strongly Agree	Factor loading	Cronbach's alpha
Bad for health	**16.1%**		0.67
I think birth control methods like implants and IUD have too many side-effects.	24.1%	0.53	
I think that not having a period on birth control is not good for you.	22.2%	0.7	
I think birth control methods like implants and IUDs have too many hormones.	19.4%	0.61	
Not for me	**8.9%**		0.68
If I had an IUD, I would be worried it would affect my sex life (be felt during sex, hurt during sex).	28.3%	0.72	
I think having a birth control method inside of me (like the implant or IUD) would hurt too much to have in.	23.1%	0.47	
I think that 3-10 years (the amount of time an implant or IUD can stay in) is too long to commit to a birth control method.	13.9%	0.43	
I don't have sex that much so I don't really think I need a method that works all the time (like the implant or IUD).	13.3%	0.47	
I think birth control is bad for your health.	7.7%	0.54	
Did not load into any factors			
It would be nice to not have a period.	65.0%	<0.3	
If I had birth control inside of me (like the implant or IUD) I would be worried I wouldn't be able to find a provider to take it out when I want.	22.4%	0.72	

* Proportion of participants who strongly agree or agree with ≥60% of items in each factor.

Table 3. LARC acceptability by sample characteristics (demographics, contraceptive history, and pregnancy intentions and feelings).

Variable	High Acceptability	Moderate acceptability	Low acceptability	P-value
	n=207 (62.3%)	n=62 (18.7%)	n=63 (19.0%)	
Age (years)	20 (14-24)	20 (15-24)	20 (14-24)	0.7
Race/Ethnicity				0.83
Non-Hispanic White	32.0%	27.4%	23.8%	
Non-Hispanic Black	8.4%	9.7%	11.1%	
Non-Hispanic Other	14.8%	19.4%	14.3%	
Hispanic	44.8%	43.5%	50.8%	
Methods used ever (including currently):				
IUD	26.6%	87.1%	85.7%	0.02
Implant	56.5%	43.5%	39.7%	0.03
DMPA	17.4%	33.9%	44.4%	<0.001
OCPs	44.0%	43.5%	58.7%	0.1
Vaginal ring	5.3%	4.8%	12.7%	0.1
Contraceptive patch	1.0%	3.2%	1.6%	0.44
Ever used LARC	72.5%	48.4%	42.9%	<0.001
Current method:				<0.001
IUD	23.4%	10.0%	1.9%	
Implant	45.1%	32.0%	16.7%	
DMPA	4.3%	28.0%	40.7%	
OCPs	9.2%	16.0%	25.9%	
Vaginal ring	2.2%	4.0%	3.7%	
Contraceptive patch	0.0%	0.0%	1.9%	
Condoms	6.0%	4.0%	0.0%	
None	9.8%	6.0%	9.3%	
Currently using LARC	68.5%	42.0%	18.5%	<0.001
When do you think you want to get pregnant?				0.73
Now/soon	1.1%	1.7%	1.7%	
In the next year	1.6%	1.7%	3.4%	
1-2 years	3.8%	3.4%	8.6%	
2-5 years	25.3%	29.3%	31.0%	
>5 years	37.4%	37.9%	27.6%	
Never	12.6%	5.2%	6.9%	
I don't know	18.1%	20.7%	20.7%	
How would you feel if you got pregnant in the next 6 months?				0.06
Really excited	4.3%	8.3%	5.5%	
A little excited	10.8%	8.3%	7.3%	
Partly excited and partly upset	24.2%	33.3%	45.5%	
A little upset	15.1%	5.0%	10.9%	
Really upset	45.7%	45.0%	30.9%	

Table 3. LARC acceptability by sample characteristics (demographics, contraceptive history, and pregnancy intentions and feelings).

Variable	High Acceptability	Moderate acceptability	Low acceptability	P-value
	n=207 (62.3%)	n=62 (18.7%)	n=63 (19.0%)	
Age (years)	20 (14-24)	20 (15-24)	20 (14-24)	0.7
Race/Ethnicity				0.83
Non-Hispanic White	32.0%	27.4%	23.8%	
Non-Hispanic Black	8.4%	9.7%	11.1%	
Non-Hispanic Other	14.8%	19.4%	14.3%	
Hispanic	44.8%	43.5%	50.8%	
Methods used ever (including currently):				
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Current method:				<0.001
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When do you think you want to get pregnant?				0.73
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2-5 years	25.3%	29.3%	31.0%	
>5 years	37.4%	37.9%	27.6%	
Never	12.6%	5.2%	6.9%	
I don't know	18.1%	20.7%	20.7%	
How would you feel if you got pregnant in the next 6 months?				0.06
Really excited	4.3%	8.3%	5.5%	
A little excited	10.8%	8.3%	7.3%	
Partly excited and partly upset	24.2%	33.3%	45.5%	
A little upset	15.1%	5.0%	10.9%	
Really upset	45.7%	45.0%	30.9%	

Table 4. Independent predictors of high LARC acceptability from logistic regression

Variable	aOR (95%CI)
Currently using LARC	4.52 (2.30-8.85)
Factors:	
Effective	6.72 (3.02-14.94)
Good attributes	3.29 (1.55-7.00)
Bad for health*	0.40 (0.15-1.03)
Scary	0.29 (0.13-0.64)
Not for me	0.09 (0.01-0.53)

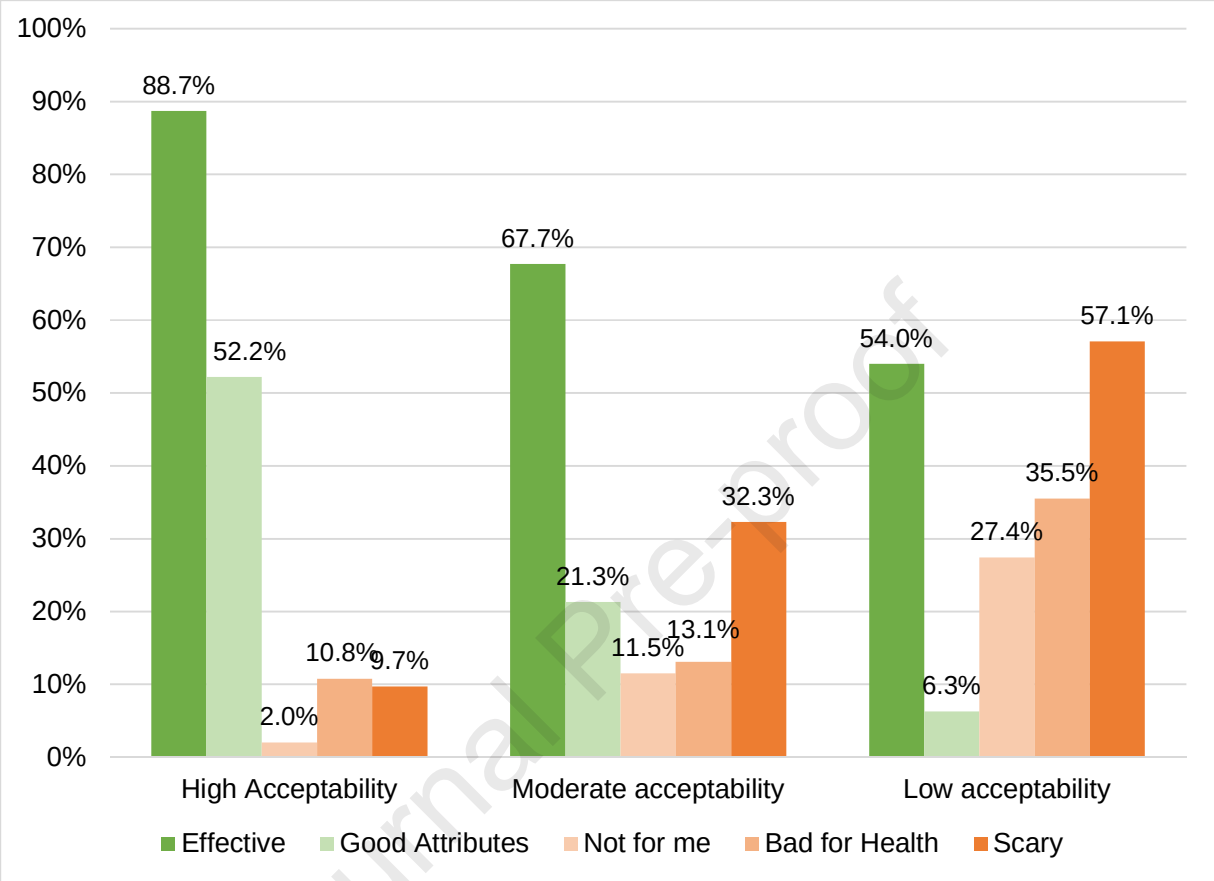
Variables included in the model: First step: Ever used LARC, currently using LARC, a little or really upset if pregnant in the next 6 months. Second step: factors
*p=0.06

Table 5. Independent predictors of high LARC acceptability from logistic regression

Variable	aOR (95%CI)
Currently using LARC	4.52 (2.30-8.85)
Factors:	
Effective	6.72 (3.02-14.94)
Good attributes	3.29 (1.55-7.00)
Bad for health*	0.40 (0.15-1.03)
Scary	0.29 (0.13-0.64)
Not for me	0.09 (0.01-0.53)

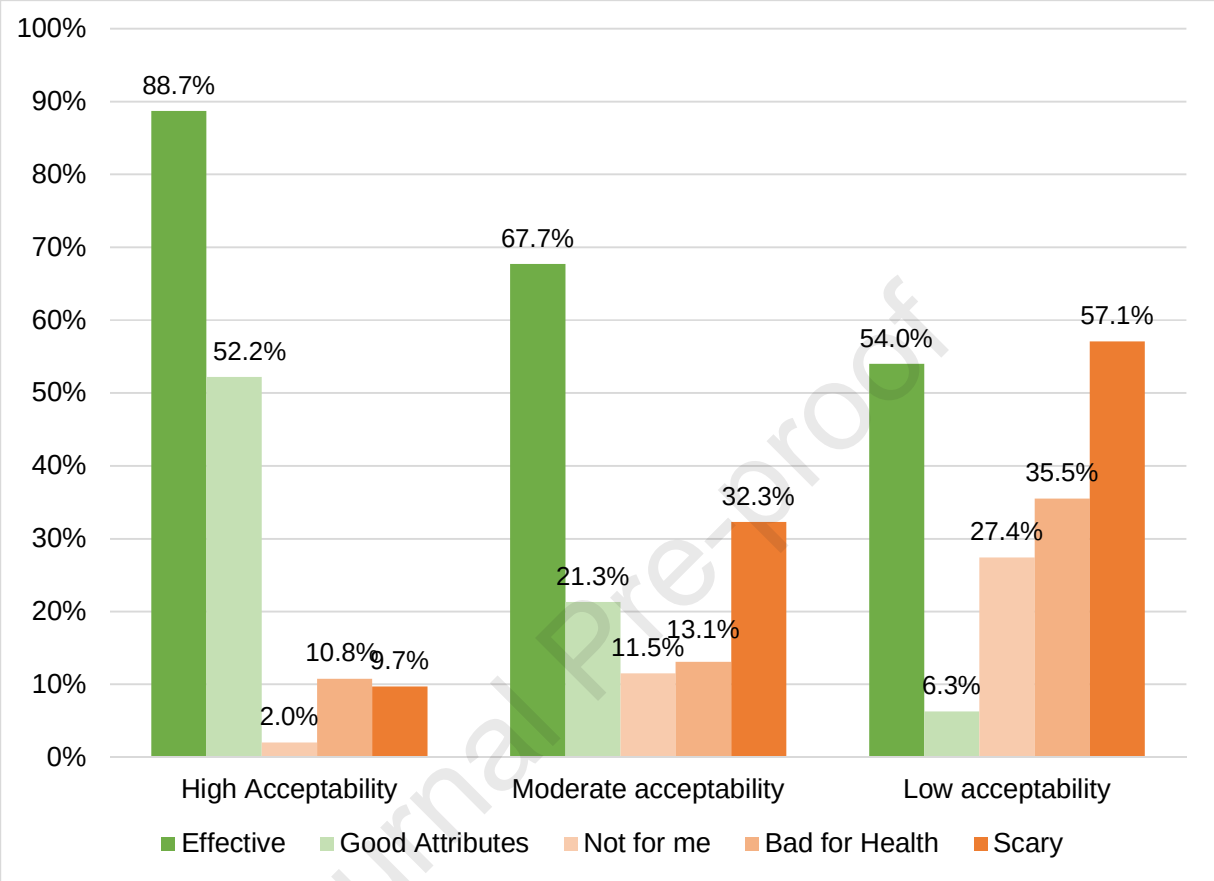
Variables included in the model: First step: Ever used LARC, currently using LARC, a little or really upset if pregnant in the next 6 months. Second step: factors
*p=0.06

Figure 4. Proportion of participants who endorse each factor by LARC acceptability category.



P for linear trend <0.001 for all factors across groups

Figure 1. Proportion of participants who endorse each factor by LARC acceptability category.



P for linear trend <0.001 for all factors across groups