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Knowledge and Intention to Use Long-Acting Reversible Contraception among University Students

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Abstract

Objective—Assess the relationship between knowledge of long-acting reversible contraception (LARC) and intention to use LARC among female students.

Participants—Convenience sample of 292 female undergraduate and graduate students at a large midwestern university

Methods—Cross-sectional in-person survey. Multivariate analysis of LARC knowledge and intention to use LARC.

Results—Total response rate was 84.9%. Among contraceptive users, 13.3% were using a LARC method. On average, respondents scored 4.8/10 (SD 2.5) on a 10-item LARC knowledge assessment. Higher levels of LARC knowledge were associated with intent to use LARC in the future in our multivariate analysis (RR 1.7, 95% CI 1.14– 2.54; $p = 0.01$). Common reasons for LARC hesitancy were a need for more information, safety concerns, and risk of undesirable side effects.

Conclusions—Low LARC knowledge and students' self-identified need for further LARC information represent an opportunity for campus contraceptive interventions which empower students to make informed reproductive decisions.

Keywords

long-acting reversible contraception; LARC; university student; college student; student health

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Prior publication:

Preliminary data from this survey were presented at Indiana University Medical Student Program for Research and Scholarship Poster Day in August 2019. Abstract with preliminary data was accepted to the European Society of Contraception's conference which was rescheduled in March 2020 and subsequently published in the conference's 2021 Book of Abstracts.

Introduction

Unintended pregnancy remains a public health challenge in the United States, with 76.9% of pregnancies among 18–19-year-olds and 58.8% of pregnancies among 20–24 year-olds considered unintended.^{1,2} Among U.S. students, 85.8% of female undergraduate students and 84.7% of female graduate students used contraception at last sex.³ Students who experience unintended pregnancy are 61% more likely to discontinue their education, may have reduced potential lifetime earnings, and are at risk for lower health and wellness long-term.^{4,5,6}

Long-acting reversible contraceptive (LARC) methods, including levonorgestrel and copper intrauterine devices (IUDs) and etonogestrel implant, are 20-fold more effective than oral contraceptive pills (OCs), the most commonly used form of contraception used by university students.^{3,5,7,8} In the U.S., LARC were used by 15.8% of contraceptive users,⁹ but only 7.9% of undergraduate contraceptive users in 2014.¹⁰ Recent data demonstrate that LARC use has increased to 24.4% of undergraduate contraceptive users and 33.0% of graduate contraceptive users in 2021.³ Resident physicians, who may also be eligible for campus health services, use LARC at much higher rates, as one study found 49.3% of obstetrics and gynecology residents were using LARC.¹¹ However, barriers to LARC uptake in university populations may still include personal factors such as lack of knowledge or concern about safety, as well as systemic barriers such as cost or lack of on-site access.^{12,13}

This study aimed to investigate the relationship between LARC knowledge and intent to use LARC among female university students at a large public university in the Midwest United States. We hypothesized that higher LARC knowledge would be associated with intent to use LARC in the future. A secondary aim was to assess awareness of the three types of LARC methods. Data were collected via questionnaire and were used to inform a comprehensive counselling initiative for the university aimed at empowering students to make informed reproductive decisions.

Materials and methods

We conducted a cross-sectional survey of female undergraduate students, graduate students, and resident physicians at a large mid-western US university from July to November 2019. All enrolled, English-speaking female students or resident physicians above age 18 were eligible for inclusion; inclusion of graduate students and resident physicians was based on their eligibility to receive campus health services. Participants were approached by study personnel at the university student health facility and campus center. The first page of the survey included an opt-in informed consent. Students who wished to be entered into a drawing for a raffle prize recorded their email address separately. The study was deemed exempt by the Institutional Review Board. We collected survey data using REDCap (Research Electronic Data Capture, Vanderbilt University, Nashville, TN, USA). Based on prior experience with surveys in the university setting, we created a target goal of 300 completed surveys. We excluded responses with less than 50% of the survey completed.

We designed the questionnaire based on prior surveys on sexual and reproductive health following guidelines for inclusive language from the Fenway Institute.^{14,15,16} The survey contained 29 items assessing: (1) knowledge of, prior use, and willingness to use LARC in the future; (2) sexual and reproductive health history and contraceptive use; (3) perceived risk of pregnancy and attitudes toward pregnancy and abortion; and (4) demographic characteristics. We pilot-tested the survey among 10 research staff and graduate students. The survey was administered in English and took on average 7–10 minutes to complete.

LARC knowledge was measured firstly by evaluating awareness of the levonorgestrel IUD, contraceptive implant, and copper IUD, and secondly by administering a 10-item true/false knowledge scale (Appendix 1) about LARC indications, side effects, and efficacy. To make language accessible to the sample population, the levonorgestrel IUD was referred to as “hormonal IUD” and the implant as “contraceptive implant/arm implant.” Participants were asked if they had ever used a LARC method and would be willing to use a LARC method in the future. We provided a list of reasons for not intending to use LARC including: cost, pain of insertion, need for more information on LARC methods, safety concerns, unexpected bleeding/spotting, provider advised not to use LARC, satisfaction with current contraceptive, side effects such as “weight gain, mental/emotional changes, acne, etc.”, inability to prevent sexually transmitted infections, difficulty in removing device, and “not suitable [for use] by someone your age”^{12,13}.

Additional survey questions assessed sexual and reproductive history. Participants were defined sexually active if they had engaged in manual, oral, anal, or vaginal sex with a partner in the past year. Respondents were asked about prior and current contraceptive use. Lastly, we collected demographic information including gender identity, sexual orientation, race, ethnicity, year in school, and measures of socioeconomic status including parental education and ability to pay basic expenses.

We used descriptive statistics such as mean and standard deviation (SD) for continuous variables and frequency and percentage for categorical variables. Since our outcome variable (intent to use LARC) was a common event (>10%), we used Poisson regression models with robust variance option to evaluate the associations between LARC knowledge and intent to use LARC in the future. We evaluated the following potential confounding variables: age, race, ethnicity, prior LARC use, relationship status, current contraceptive use, history of vaginal intercourse, and difficulty with paying basic expenses. Confounding variables were identified if the effect size of LARC knowledge over LARC consideration changed by 10% or more when the confounding variable was added to the model compared to that from the univariable model. Confounding factors were included in a final multivariable model to estimate the independent effect of LARC knowledge over intent to use LARC. We assessed for differences in students’ awareness of the levonorgestrel IUD vs. copper IUD vs. contraceptive implant using McNemar’s test. Respondents’ reasons for not using or being uncertain about LARC use in the future were summarized with descriptive statistics.

Results

Three hundred and forty-four students were approached for the survey. After excluding incomplete surveys ($n = 6$) and surveys missing informed consent ($n = 2$), our analysis included 292 respondents for a response rate of 84.9%. The majority of surveys (more than 80%) were collected at the university campus center. The mean age of respondents was 20.2 years ($SD\ 2.6$), and 18.8% were graduate students while 1.7% were resident physicians. Regarding racial identity: 76.0% of respondents identified themselves as white, 13.0% Asian, 7.9% Black or African American, 1.4% Native American, and 4.5% identified as another race or were multiracial. Additionally, 8.9% of respondents were Hispanic/Latinx. Regarding sexual orientation, 14.6% identified as a sexual minority, with 9.2% of respondents identifying as bisexual. As a measure of socioeconomic status, 17.9% of students reported difficulty paying for basic expenses,

Among respondents, 61.4% reported a history of intercourse involving penetration of a penis in the vagina and 67.0% reported any sexual activity in the past year. In the entire sample, 64.0% of students ($n = 187$) were using one or more contraceptive methods, with OCPs used most frequently by 62.0% of contraceptive users. Of contraceptive users, 8.0% were using a levonorgestrel IUD, 0.5% were using a copper IUD, and 4.8% were using the etonogestrel implant for a total of 13.4% of contraceptive users using a LARC method.

Excluding students currently using a LARC, the average score on the 10-item LARC knowledge assessment was 4.8/10 ($SD\ 2.5$). For each item on the assessment, the maximum amount of missing data was 4.7% ($n = 14$). When respondents were asked if they would use a LARC method in the future, 39.5% would not use LARC, 27.2% would use LARC, 23.4% were uncertain, and 7.6% said the question did not apply to them personally. Intention to use LARC was not associated with age or relationship status.

Univariable analysis demonstrated a statistically significant difference in willingness to use a LARC in the future between students scoring below the mean (less than or equal to 5) vs. above the mean ($RR\ 1.81$, 95% $CI\ 1.24 - 2.65$; $p < 0.01$) on the LARC knowledge assessment. The association between above-average LARC knowledge and intent to use LARC in the future was also statistically significant in the multivariable analysis ($RR_{adj}\ 1.70$, 95% $CI\ 1.14 - 2.54$; $p = 0.01$) after controlling for the confounding variable of difficulty in paying basic expenses.

A secondary aim was gauging students' awareness of the three types of LARC. Among respondents who were not currently using a LARC, 77.5% were aware of the levonorgestrel IUD, 61.4% of the copper IUD, and 86.5% of the etonogestrel implant. There was a statistically significant difference in the percentage of students who had heard of each of the three LARC methods ($p < 0.001$), with awareness of the two hormonal methods higher than awareness of the copper IUD.

Students who indicated they would not consider LARC or were uncertain ($n = 144$) identified their reasoning from a list of options. Among students who were not currently using LARC, would not consider LARC, or were uncertain about using LARC, the most commonly identified reasons were a 'need more information on LARC' ($n = 62$, 43.1%), the

‘pain of insertion’ (n = 51, 35.4%), ‘concern over safety’ (n = 50, 34.7%), and ‘side effects, such as weight gain, mental/emotional changes, acne, etc.’ (n = 45, 31.2%).

Discussion

This survey demonstrated that female students at this university not currently using LARC methods had low knowledge of LARC as measured by our 10-item assessment (mean less than 5 out of 10). Higher levels of LARC knowledge were associated with intent to use LARC in the future. Students were more aware of the hormonal LARC (levonorgestrel IUD and etonogestrel implant) than the copper IUD. Respondents who indicated that they did not intend or were uncertain about choosing a LARC method in the future most commonly cited a need for more information, followed by concern about pain, safety, and potential side effects of LARC.

Strengths of this study include a reasonable sample size for a university population and a high response rate which helps to mitigate response bias. Limitations include generalizability, as the survey represents only one public university in the Midwest, and that respondents’ intent to use LARC may not actualize into use when many other barriers may come into play. The cross-sectional nature of the survey also prohibits interpretation of causation between LARC knowledge and intention to use LARC.

Our findings are consistent with a recent study of contraceptive counselling sessions with female college students which found that higher levels of LARC knowledge were associated with higher LARC interest.¹⁷ Another study also found that unmarried young adults with higher knowledge of IUDs were six times as likely to be current LARC users.¹⁸ A recent study of female college students found that older age and relationship status were the strongest predictors of current LARC use.³ In our study, neither age nor relationship status were associated with intention to use LARC in the future. However, intent to use LARC as measured in our study is clearly different than actual LARC use, as many barriers may exist between an individual’s intention to use a LARC method and actual use of the device, which often requires high up-front costs. Such socioeconomic barriers may certainly be present in our study, since 17.8% of respondents reported difficulty paying basic expenses.

Low levels of LARC knowledge and differences in awareness of the three LARC methods among students in this survey demonstrate potential for a comprehensive contraceptive counselling initiative. Students most commonly cited a need for more information as a barrier to LARC use, which indicates an opportunity to provide such education on campus tailored for university students. Similar previous interventions demonstrated success.¹⁷ Additionally, data from the larger-scale Contraceptive CHOICE study demonstrated that when provided with education, access, and no-cost contraception, young women often choose LARC methods, indicating the potential for increased interest in LARC when such barriers are removed.¹⁵ Questions for additional exploration include assessing the association between LARC knowledge and intent to use LARC in other U.S. university settings. Furthermore, respecting reproductive autonomy is of utmost importance;¹⁹ thus, the goal of a future LARC knowledge initiative should be to empower students to make informed decisions about their reproductive choices.

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Data availability statement:

Data from this manuscript are available at: Peipert, Jeffery (2021), “Knowledge and Intention to Use LARC”, Mendeley Data, V1, <http://dx.doi.org/10.17632/x7k7cg7pc5.1>.

Appendix 1: 10-item LARC knowledge assessment (True/False)

1. Having an IUD (intrauterine device) increases the risk of having a pelvic infection, including pelvic inflammatory disease (PID) or any infection in the uterus/womb, fallopian tubes, and/or ovaries.
2. The IUD (intrauterine device) should be used only in women who already have children.
3. Having an IUD (intrauterine device) increases the risk of infertility (inability to have a child).
4. The IUD (intrauterine device) should not be used if a woman has any history of sexually transmitted infections (such as chlamydia, gonorrhea, genital herpes, etc.).
5. IUDs (intrauterine devices) and the arm implant (ex: Nexplanon) are effective in preventing pregnancy for several years while they are in place.
6. Both the hormonal IUD (intrauterine device) and copper IUD are more effective than birth control pills at preventing pregnancy.
7. The hormonal IUD can be used to improve or eliminate difficult period symptoms, such as cramps, heavy bleeding, etc.
8. The copper IUD can be used for emergency contraception (ex: instead of Plan B pills after contraceptive non-use or failure).
9. The contraceptive implant (ex: Nexplanon) is more effective than birth control pills at preventing pregnancy.
10. Contraceptive implants (ex: Nexplanon) are removed by a healthcare provider upon expiration or when desired by the patient.

References

1. Healthy people 2020. U.S. Department of Health and Human Services <https://www.healthypeople.gov/>. Accessed June 11, 2020.
2. Finer LB, Zolna MR. Declines in Unintended Pregnancy in the United States, 2008–2011. *N Engl J Med* 2016;374(9):843–852. doi:10.1056/NEJMsa1506575 [PubMed: 26962904]

3. American College Health Association. National College Health Assessment. Group Executive Summary Spring 2021. https://www.acha.org/documents/ncha/NCHA-III_SPRING-2021_UNDERGRADUATE_REFERENCE_GROUP_EXECUTIVE_SUMMARY_updated.pdf Published 2021. Accessed December 7, 2021.
4. Unplanned Pregnancy Among College Students and Strategies to Address It. The National Campaign to Prevent Teen and Unplanned Pregnancy <https://powertodecide.org/sites/default/files/resources/primary-download/briefly-unplanned-pregnancy-college.pdf>. Published 2015. Accessed January 27, 2021.
5. Gipson JD, Koenig MA, Hindin MJ. The Effects of Unintended Pregnancy on Infant, Child, and Parental Health: A Review of the Literature. *Stud Fam Plann* 2008;39(1):18–38. doi:10.1111/j.1728-4465.2008.00148.x [PubMed: 18540521]
6. Dehlendorf C, Rodriguez MI, Levy K, Borrero S, Steinauer J. Disparities in family planning. *Am J Obstet Gynecol* 2010;202(3):214–220. doi:10.1016/j.ajog.2009.08.022 [PubMed: 20207237]
7. Espey E, Ogburn T. Long-Acting Reversible Contraceptives: Intrauterine Devices and the Contraceptive Implant. *Obstet Gynecol* 2011;117(3):705–719. doi:10.1097/AOG.0b013e31820ce2f0 [PubMed: 21343774]
8. Secura GM, Madden T, McNicholas C, Mullersman J, Buckel C, Zhao Q, et al. Provision of No-Cost, Long-Acting Contraception and Teenage Pregnancy. *N Engl J Med* 2014;371(14):1316–1323. doi:10.1056/NEJMoa1400506 [PubMed: 25271604]
9. Kavanaugh ML, Jerman J. Contraceptive method use in the United States: trends and characteristics between 2008, 2012 and 2014. *Contraception* 2018;97(1):14–21. doi:10.1016/j.contraception.2017.10.003 [PubMed: 29038071]
10. Logan RG, Thompson EL, Vamos CA, Griner SB, Vázquez-Otero C, Daley EM. Is Long-Acting Reversible Contraceptive Use Increasing? Assessing Trends Among U.S. College Women, 2008–2013. *Matern Child Health J* 2018;22(11):1639–1646. doi:10.1007/s10995-018-2560-8 [PubMed: 29936659]
11. Zigler RE, Peipert JF, Zhao Q, Maddipati R, McNicholas C. Long-acting reversible contraception use among residents in obstetrics/gynecology training programs. *Open Access J Contracept* 2017;8:1–7, doi: 10.2147/OAJC.S126771 [PubMed: 29386949]
12. Hall KS, Ela E, Zochowski MK, Caldwell A, Moniz M, McAndrew L, 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(6):556–564. doi:10.1016/j.contraception.2016.02.007 [PubMed: 26879627]
13. McCaffrey K, MacAfee L, Howard A, Howe A, Brown S. Patient-perceived barriers to accessing long-acting reversible contraception among college students. *Contraception* 2017;96(4):292. doi:10.1016/j.contraception.2017.07.112
14. Peipert BJ, Scott DM, Matteson KA, Clark MA, Zhao Q, Peipert JF. Sexual Behavior and Contraceptive Use at Brown University: 1975–2011. *J Reprod Med* 2016;61(3–4):101–108. [PubMed: 27172631]
15. McNicholas C, Madden T, Secura G, Peipert JF. The contraceptive CHOICE project round up: what we did and what we learned. *Clin Obstet Gynecol* 2014;57(4):635–643. doi:10.1097/GRF.000000000000070 [PubMed: 25286295]
16. Focus on Forms and Policy: Creating an Inclusive Environment for LGBT Patients. National LGBT Health Education Center, A Program of the Fenway Institute <https://www.lgbtqihealtheducation.org/wp-content/uploads/2017/08/Forms-and-Policy-Brief.pdf>. Accessed February 7, 2021.
17. Moore CL, Edie AH, Johnson JL, Stevenson EL. Long-acting reversible contraception: Assessment of knowledge and interest among college females. *Journal Am Coll Health* 2019;67(7):615–619. doi:10.1080/07448481.2018.1500473 [PubMed: 30239327]
18. Dempsey AR, Billingsley CC, Savage AH, Korte JE. Predictors of long-acting reversible contraception use among unmarried young adults. *Am J Obstet and Gynecol* 2012;206(6):526.e1–526.e5. doi:10.1016/j.ajog.2012.02.014

19. Zeal C, Higgins JA, Newton SR. Patient-Perceived Autonomy and Long-Acting Reversible Contraceptive Use: A Qualitative Assessment in a Midwestern, University Community. *Biores Open Access* 2018;7(1):25–32. doi:10.1089/biores.2017.0037 [PubMed: 29588877]

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