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# Prevalence and determinants of long-acting reversible contraception initiation among teenage mothers in a tertiary hospital

Ma. Shenny Joy A. Santiago<sup>1</sup>, Mona Liza B. Pastrana<sup>1</sup>

## Abstract:

**BACKGROUND:** According to the WHO, about 16 million girls at the age of 15–19 years give birth each year. In the Philippines, 600 live births a day are registered under teenage mothers. At Mariano Marcos Memorial Hospital and Medical Center, 12% of all obstetric admissions yearly are teenagers. The American College of Obstetricians and Gynecologists recommends long-acting reversible contraception (LARCs), in the form of intrauterine device and progestin subdermal implant as pregnancy prevention options for young mothers. The objective of the study was to identify the prevalence and determinants of long-acting reversible contraception (LARC) initiation among teenage mothers in Mariano Marcos Memorial Hospital and Medical Center.

**METHODOLOGY:** Prospective observational study: A self-administered questionnaire was given to the respondents wherein they ranked determinants involved in their selection of a contraceptive method on a scale of 1–4 (1 being the most important, and 4, the least important).

**RESULTS:** A total of 162 teenage mothers participated in the study. Majority of the respondents were 17–18 years old, enrolled up to high school, single, unemployed, and primiparas. Eighty-seven percentage of all teenage mothers admitted at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021 used long-active reversible contraception. Ranked from most (1) to least (4) important, the respondents considered: (1) Effectivity, (2) Long duration, (3) Family influence, and (4) Peer influence as their determinants for initiating LARC method. The high effectiveness and long duration of LARC were the primary reasons for initiation, while the least factors they considered were that of peer and family influence.

## Keywords:

Intrauterine device, long-acting reversible contraception, progestin subdermal implant, teenage pregnancy

<sup>1</sup>Department of Obstetrics and Gynecology, Mariano Marcos Memorial Hospital and Medical Center, City of Batac, Ilocos Norte, Philippines

## Address for correspondence:

Dr. Ma. Shenny Joy A. Santiago,  
Department of Obstetrics and Gynecology, Mariano Marcos Memorial Hospital and Medical Center, Barangay 6, San Julian, City of Batac, Ilocos Norte, Philippines.  
E-mail: [shennysantiago@yahoo.com](mailto:shennysantiago@yahoo.com)

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## Introduction

### Background of the study

According to the World Health Organization, about 16 million girls at the age of 15–19 years and around 1 million girls under the age of 15 years give birth each year. In the Philippines, 600 live births a day are registered under teenage mothers.<sup>[1]</sup> One out of ten adolescent girls gets pregnant.

A study by the Young Adult Fertility and Sexuality documented that 14% of Filipino girls at the age of 15–19 years are already pregnant with their first child.

In 2017, the Philippines topped the regional list of Asian countries that continued to have the greatest number of teenage pregnancies.<sup>[2]</sup> Teenage pregnancy increased by 65% from 2000 to 2010. The National Economic Development Authority and Population Commission

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described the alarmingly high teenage pregnancy rate in the country as a “national emergency.”

At Mariano Marcos Memorial Hospital and Medical Center, 12% of all obstetric admissions in the year 2018 were teenagers with an average age of 18 years.

Childbearing in teenagers poses an increased risk for poorer health outcomes. It is associated with health problems such as pre-eclampsia, anemia, sexually transmitted diseases, neonatal morbidities and mortalities, and other pregnancy complications. Through an effective family planning, delaying early motherhood, spacing births, abortions, avoiding unintended early pregnancies, and advocating stopping childbearing when they have reached their intended family size, one could prevent one in every three maternal deaths globally.<sup>[3-5]</sup>

In 2012, the American College of Obstetricians and Gynecologists (ACOG) revised its practice guidelines on Long-acting reversible contraception (LARCs), including implants and IUDs. Based on research and expert opinions, the new guidelines advise that adolescents who are sexually active and at high risk of unintended pregnancy should be encouraged to consider LARCs as a contraceptive option.<sup>[6]</sup>

LARCs are ideal pregnancy prevention options for young mothers. These methods are effective, inexpensive, reversible, and safe. They also require minimal maintenance and have better compliance rates than other hormonal methods like short-acting contraceptives. However, until this day, the use and maintenance of LARCs is not widespread among teenage mothers.

This study aimed to identify the prevalence and determinants of long-acting reversible contraception (LARC) initiation among teenage mothers in Mariano Marcos Memorial Hospital and Medical Center.

### Objectives of the study

General objectives:

1. To describe the demographic characteristics of teenage mothers who delivered at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021, who used long-acting reversible contraception (LARC)
2. To identify the prevalence of long-acting reversible contraception (LARC) use among teenage mothers who delivered at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021
3. To identify the determinants of long-acting reversible contraception (LARC) initiation among teenage

mothers who delivered at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021.

Specifically, the study aimed to answer the following:

1. Among the teenage mothers who delivered at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021, how many percent used LARC? How many percent did not use LARC?
2. Among the teenage mothers who used LARC, how many percent used IUD? Among the teenage mothers who used LARC, how many percent used implant?

### Significance of the study

LARC methods are one of the most cost-effective forms of contraception which could provide powerful protection against teen and unintended pregnancies. At Mariano Marcos Memorial Hospital and Medical Center, 12% of all obstetric admissions in the year 2018 were teenagers with an average age of 18 years. This study may serve as data for health-care providers to create awareness among teenage mothers about the importance of modern family planning. The results may also serve as basis for advocacy programs related to unintended teenage pregnancies.

### Definition of terms

1. A long-acting reversible contraceptive (LARC) method – a birth control method which provides an effective contraception for an extended period of time without requiring user action
2. Intrauterine device (IUD) – small flexible plastic devices inserted into the uterus to prevent pregnancy. IUDs are inserted and removed by trained obstetricians and gynecologists
3. Contraceptive implants – a thin rod made from flexible plastic inserted beneath the skin on a woman’s upper arm. The implant’s mechanism of action is to release a steady amount of progestin by primarily suppressing ovulation, thus preventing pregnancy. It can last for up to 3 years. Implants must be inserted and removed by trained obstetricians and gynecologists
4. Teenage mothers – women ages 13–19 years of age who have given birth.

### Review of Related Literature and Studies

Long-acting reversible contraception (LARC), comprising subdermal implants and IUDs, offers women the most effective protection against pregnancy coupled with high continuation rates and affordability,<sup>[7]</sup> yet only 5% of sexually active adolescents using contraception have an IUD, and fewer have a contraceptive implant.<sup>[8]</sup>

In the Philippines, the 2011 Family Health Survey conducted a questionnaire which updated the findings from the 2006 Family Planning Survey and 2008 National Demographic and Health Survey. The results showed an almost stagnant trend in the use of contraception among currently married women of reproductive age, i.e. 15–49 years in the Philippines. The top five reasons why they did not use family planning methods are because they feared the side effects, desire of having more children, inaccessibility of family planning methods, infrequent or no sexual contact, and infecundity.

In a study done by Natividad (2013), in 2011, pregnant women at the age of 15–19 years had the highest percentage (37%) with unmet need for family planning, mostly spacing for births, compared to 19% for all currently married women. It signifies that adolescent mothers are an underserved segment of reproductive health programs and services. According to the study, the high unmet need for contraception among currently cohabiting or married teens requires specific services and family programs for this group because teenage mothers have the lowest birth intervals (median of <24 months) and expose themselves to greater risks of a subsequent pregnancy.<sup>[9]</sup>

Teenagers are among the highest risk group for unplanned pregnancy.<sup>[12]</sup> LARC methods such as IUDs and subdermal implant are the most effective contraceptive methods that are user-independent, safe, and easy to forget. In the adolescent population, these methods should have the highest rates of satisfaction and continuation because they are highly cost-effective.

The copper IUD is a T-shaped small flexible rod that has a copper wrapped around it. This device prevents pregnancy by creating an inflammatory reaction in the uterine cavity, thereby disrupting the implantation of a fertilized egg. IUDs are 99.4% effective with perfect use and 99.2% effective with typical use.

IUDs are highly effective, safe, and have no effect on the quality or quantity of breast milk. They provide low cost and do not interfere with sexual intercourse. Some of the unique advantages of IUD are its one-time application and immediate return to fertility on removal. These are very long-lasting, with effectiveness until 12 years.

According to the Philippine Clinical Standard Manual on Family Planning (2014), three factors must be considered before inserting the IUD among teenagers.<sup>[25]</sup> First, expulsion is likely to occur in nulliparous adolescents who have started sexual activity because of the small size of the uterus. Second, the risk of failure is less than the risk of pregnancy, and last, this method may not be appropriate for certain adolescents at higher risk

of sexually transmitted diseases. In addition, some of the adverse effects of IUD are menstrual irregularities, some cramping, and it requires regular checking of IUD string. Like the subdermal implant, it requires a trained health-care provider for insertion and removal.

The use of a daily regimen may be inappropriate due to the unpredictable frequency of intercourse and the need for privacy with regard to birth control and sexual practices. High discontinuation rates among teenagers are due to low threshold to tolerance to some side effects.

The subdermal implant is a single-rod, progestin-only implant measuring 4 cm in length and 2 mm in diameter. Due to its progestin effects, it works by inhibiting ovulation as well as thickening of cervical mucus and thinning of the endometrial lining. Like the IUD, the subdermal implant provides excellent contraceptive effectiveness, safety, and long-lasting effects until 3 years.

Subdermal implants are 99.9% effective with perfect use and 99.5% effective with typical use. The advantages of using subdermal implants are: it does not require daily intake, does not interfere with intercourse, effective within 24 h of insertion, no estrogen-related side effects such as nausea and dizziness, and it does not affect the quantity and quality of breast milk. Some of the beneficial noncontraceptive effects include: prevention of iron-deficiency anemia, helps reduce the risk of endometrial cancer, and reduces the risk of ectopic pregnancies.

Some of the disadvantages of using the subdermal implant include: clients cannot start or stop on their own because rods must be inserted and removed by a trained health-care provider. In addition, minor surgical procedure with local anesthesia is required to insert and remove rods. There may be discomfort at the insertion site up to several days after the insertion. It also does not provide protection against sexually transmitted diseases. Subdermal implants may also have the following effects such as menstrual irregularities, weight gain, or rarely, infection on the insertion site.

Across all ages, contraceptive methods that are coital or user dependent (condoms, pills, patch, ring, and injections) have higher typical use failure rates.<sup>[10]</sup> Adolescents are at a higher risk of inconsistent contraceptive use than are other populations. A New England Journal study said that there is an increased risk of contraceptive failure among young women below 21 years who are using the contraceptive pill, ring, or patch compared to older women.<sup>[11]</sup> In this study, adolescents had the same low failure rates with LARC methods as those above 21 years of age. LARC

methods are user independent, and therefore, require no effort by the patient after initial insertion. This results in essentially equal typical and perfect use failure rates.

Bharadwaj (2012) identified the factors relevant to adolescents when selecting a LARC method. A total of 205 respondents were asked to score factors involved in their selection of a contraceptive method on a scale of 1–4 (with 1 being the least important and 4 the most important). His study concluded that the most important factors when choosing a contraceptive method were: efficacy (84%), protection from sexually transmitted diseases (58%), noninterference with sex (44%), and partner's satisfaction (40%). On the other hand, the possibility of altering the menstrual pattern and reversibility was not considered important.<sup>[13]</sup> Qualities of LARCs such as reliability and long duration of action encouraged young women to accept. Qualities of LARCs such as reliability and long duration of action encouraged young women to accept these methods. Aside from that, the positive experience of these young women's peers on LARCs is enticing for them. On the other hand, fear of pain and needle is what keeps them from choosing LARCs.

In a study done by Hendrick (2020), five themes were identified as facilitators to LARC use: characteristics, individual characteristics, social network, health-care systems, and historical and geographical region. The results revealed that adolescents noted the ease and long-acting nature of LARCs as reasons for both choosing these and facilitating their continued and consistent use of these methods. Family, friends, and partners were considered potential facilitators or barriers to LARC initial use. The reviewed studies revealed that adolescents in the qualitative studies often described their mothers and older female family members as central figures in helping them successfully obtain the LARC methods they desired. On the other hand, adolescents' partners seemed to only play a minor role in their decisions.

The Contraceptive CHOICE Project is one of the largest prospective cohort studies of women in the United States seeking reversible contraception that has shifted its method use from less to more effective methods, which could provide powerful protection against the teen and unintended pregnancies.<sup>[15]</sup> Results from the project say that women preferred the most effective and least user-dependent methods when the barriers of cost, knowledge, and access are removed.

The ACOG supports immediate postpartum LARC insertion (i.e. before hospital discharge) as the best practice, recognizing its role in preventing rapid repeat and unintended pregnancy.<sup>[16]</sup> Adolescents are at high risk of a short interpregnancy interval, which is associated with lower rates of maternal educational achievement

and employment and higher rates of preterm birth and small-for-gestational-age infants.<sup>[17-19]</sup> Adolescents who use LARC methods after their first pregnancy are at significantly lower risk of repeat adolescent pregnancy.<sup>[20,21]</sup>

Increasing the usage of LARC can decrease unintended pregnancy and abortion rates, thus leading to better financial, educational, mental, social, and economic situations for women and their families.<sup>[22]</sup>

## Methodology

### Study design

This was a prospective observational study.

### Research settings

The study was conducted at Mariano Marcos Memorial Hospital and Medical Center department of obstetrics and gynecology. The Mariano Marcos Memorial Hospital and Medical Center is a department of health retained-hospital. It is a 200-bed capacity tertiary hospital located in Ilocos Norte. It is a referral center in Ilocos Region with obstetrics and gynecology as one of its departments accredited for training.

### Study population

The study population comprised teenage mothers who delivered and consulted at Mariano Marcos Memorial Hospital and Medical Center under charity service from December 2020 to December 2021.

The inclusion criteria were as follows:

1. Teenage mothers aged 13–19 years, primipara or multipara who received
  - a. Progestin subdermal implant (PSI) OR
  - b. IUD.

The exclusion criteria were as follows:

1. Teenage mothers aged 13–19 years, primipara or multipara who received nonlong-acting reversible contraceptives such as oral contraceptive pills and injectables
2. Teenage mothers aged 13–19 years, primipara or multipara who received permanent sterilization techniques like bilateral tubal ligation
3. Teenage mothers aged 13–19 years, primipara or multipara, who are victims of sexual abuse.

### Data collection

There was a self-administered questionnaire developed and used from a previous literature review<sup>[13]</sup> and was tested before initiation of the survey on a sample similar to the population.

Once the participants who met the inclusion criteria, have accepted and agreed to be part of the research, a



written informed consent was obtained. Participation in this research was voluntary and could be discontinued at any time without penalty or loss of any benefits. It was explained that those who withdraw at any time will still be provided clinical management.

Once consent was obtained, a questionnaire sealed in a folder was distributed to the participants who were given long-acting reversible contraception immediately postpartum, on discharge or on follow-up at the outpatient department. The primary investigator administered the said questionnaire, and respondents were given 30–45 min to answer. They were requested to rank factors involved in their selection of a contraceptive method on a scale of 1–4 (1 being the most important and 4 the least important).

For participants <15 years, assent forms were used and signed by their guardians or parents.

### Population size/sample size

The study employed convenience sampling at the Mariano Marcos Memorial Hospital and Medical Center tertiary hospital's obstetrics and gynecology department. The prevalence rate (%) was used to determine the teenage mothers who employed IUD or Implant.

In 2017 and 2018, there were 2,000 mothers who gave birth at Mariano Marcos Memorial Hospital and Medical Center. Approximately 12% (240 patients) of all obstetric admissions were comprised of teenage mothers. A target sample size of 162 participants was set, corresponding to an expected 95% confidence interval with a 5% margin of error.

Where:  $N$  (sample size) =  $z^2PQ/d^2$

$z = 1.96$  (based on the desired confidence level of 95%)

$P$  = Anticipated value of the proportion to be estimated in the population

=0.12 (prevalence of teenage mothers based on the total admission rate of [Mariano Marcos Memorial Hospital and Medical Center] last 2017 and 2018)

$Q = 1 - P$  (the compliment of  $P$ , where  $P + Q = 1$ )

=  $(1-0.12) = 0.88$

$d$  = margin of error or maximum permissible error  
=0.05<sup>2</sup>

therefore,  $n = \frac{(1.96)^2(0.12)(0.88)}{(0.05)^2} = 162$

### Data presentation and statistical treatment

The data were entered and encoded using Microsoft Excel and analyzed using the Statistical Package for

Social Sciences (SPSS) software. Univariate analysis like the mean was used to describe the prevalence rate. Participants were asked to rank each statement from the most to least important statement why they the LARC method of their choice. To assess the determinants of LARC initiation, the mean rank was used.

### Ethical considerations

This research protocol was submitted to the Mariano Marcos Memorial Hospital and Medical Center Research Ethics Board for review and approval. The study was conducted on approval by the review panel. The study was conducted according to the principles of the International Conference on Harmonization-Good Clinical Practice. An informed consent was requested from participants for assurance that the protected health information will not be reused or disclosed to any other person or entity except as required by law and for authorized oversight of the research study or for the research, for which the use of disclosure of protected health information will be permitted by the Data Privacy Act of 2012.

All patients' information was made anonymous and confidential from data collection onward. On the data collection sheet, anonymity was maintained by assignment of a number code for each patient's information sheet. Data were kept confidential, and the file containing the patients' identity will be password protected. Only the primary investigator and the research adviser had access to the data gathered. Results were not to be used as an evaluation tool for the training, but for research purposes only.

All expenses for the development and completion of this study were shouldered by the primary investigator. No conflict of interest arose from this study.

## Results and Discussion

A total of 162 patients answered the survey questionnaire. Majority of the respondents, 88 (54%) were 17–18 years old. All of them went to school with 137 (85%) enrolled up to high school. Most of the respondents are single (77%) and unemployed (95%). Among the patients, 137 (85%) got pregnant only once, while 25 (15%) had 2 or more pregnancies. The demographic distribution of the respondents is presented in Table 1.

A total of 187 teenage mothers delivered at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021. Of 187, 162 teenage mothers (87%) used long-acting reversible contraceptives. Eighty-six (53%) of them used IUD, while 76 (47%) of them used PSI. Twenty-five out of 187 teenage mothers did not use long-acting reversible contraceptives. Some of them

opted progestin-only pills, while a few of them did not opt for any contraceptive. The prevalence of LARC users among teenage mothers at Mariano Marcos Memorial Hospital and Medical Center is presented in Table 2.

As seen in Table 3, All respondents were asked to rank the statements, leading to their LARC initiation. Based on the average rankings, the facts that LARC prevents pregnancy and lasts for 3–10 years ranked the highest as determining factors for using LARC. A study conducted by Melo *et al.* in 2015 identified that a strong desire for preventing pregnancy and the high contraceptive effectiveness of LARC were the primary reasons for initiating LARC across four

qualitative studies. Many participants in this study had experienced prior pregnancies during their adolescent years, and thus, the high contraceptive effectiveness of LARC was noted as a particularly attractive characteristic over other methods. The conclusion of the study by Bharadwaj in 2012 was that high efficacy (84%) was the top salient factor when choosing a contraceptive method. Five studies (one prospective cohort study and four qualitative studies) noted the ease of maintenance and long-acting nature of LARC over other contraception methods are the main reasons for initiating use.<sup>[25]</sup> Hendrick *et al.* (2020) supports this finding, wherein their study noted that participants found the several-year-long duration of the methods to be appealing when making contraceptive decisions.<sup>[24]</sup> In a research conducted by Bharadwaj (2012), “reliability” emerged as the main reason for choosing LARC for contraception, and “no need to remember anything” was the more frequently reported factor. The most common reason for choosing an IUD was their reliability; while for the implant, it was its 3-year duration. In the Contraceptive CHOICE Project, the largest prospective cohort study in 2007 of 9256 women in St. Louis area, 75% of women chose a LARC method due to effectiveness and long duration.<sup>[14]</sup>

The next consideration was that the patients were told by their family to use IUD/implant. The least of their considerations was the patients’ friends having used IUD/implant. The results show that their peers and family members play an important role in their decision to use LARC. Hendrick *et al.* (2020) were able to identify facilitators and barriers to the use of LARC among teenagers under various themes. Family, friends, and partners of adolescents were considered potential facilitators of LARC initial use.<sup>[24]</sup> Mothers and older family members arose as salient facilitators by assisting adolescents navigate access to initial LARC use. Adolescents’ friends had mixed influence: They sometimes acted as facilitators and other times as barriers depending on the friends’ knowledge and attitudes toward LARC methods. In Rubin’s study in 2016, participants noted that the support they received from their mothers and older female family members was crucial in making their contraceptive choices and successfully obtaining IUDs.<sup>[27]</sup> The reported influence of friends on contraceptive decision-making in four qualitative studies was mixed. Participants discussed how they integrated the information they received from friends about personal experiences with LARC, but ultimately noted that the decision of which method would be best for them was based on their own contraceptive needs and preferences (Melo *et al.*, 2015).<sup>[25]</sup> Relatedly, hearing about undesirable side effects of LARC from friends was a major deterrent for some participants, but not others (Murphy *et al.*, 2017).<sup>[26]</sup>

**Table 1: Demographics of teenage mothers at a tertiary hospital, who initiated long-acting reversible contraception (n=162)**

Characteristic	Frequency (%)
Age	
13-14	6 (4)
15-16	29 (18)
17-18	88 (54)
19	39 (24)
Educational status	
None	0
Up to elementary	23 (14)
Up to high school	137 (85)
Up to college	2 (1)
Marital status	
Single	125 (77)
Married/live-in	37 (23)
Employment	
Employed	8 (5)
Unemployed	154 (95)
Parity	
G1	137 (85)
G2 and up	25 (15)

**Table 2: Prevalence rate of long-acting reversible contraception users among teenage mothers at the tertiary hospital**

Prevalence	Frequency (%)
Teenage mothers who used LARC	162 (87)
IUD	86 (53)
Implant	76 (47)
Teenage mothers who did not use LARC	25 (13)

LARC: Long-acting reversible contraception, IUD: Intrauterine device

**Table 3: Determinants of long-acting reversible contraception initiation among teenage mothers at the tertiary hospital**

Statements	Mean rank
My friends have used IUD/implant before	3.69
My family told me to use IUD/implant	2.54
It stops me from getting pregnant	1.72
It will last long (3-10 years)	2.06

IUD: Intrauterine device

## Conclusion

A total of 162 teenage mothers participated in the study. Majority of the respondents were 17–18 years old, enrolled up to high school, single, unemployed, and primiparas. Eighty-seven percentage of all teenage mothers admitted at Mariano Marcos Memorial Hospital and Medical Center from December 2020 to December 2021 used long-acting reversible contraception. Ranked from the most (1) to least (4) important, the respondents considered: (1) Effectivity, (2) Long duration, (3) Family influence, and (4) Peer influence as their determinants for initiating LARC method.

## Limitations of the study

The author of this study noted that the four determinants related to LARC use may overrepresent the respondents' primary reasons for starting a method. Another limitation also is the use of descriptive study through the prevalence and mean rank. The use of correlation between the determinants and the sociodemographic factors would have made the study stronger and more valid. The study sample was relatively small ( $n = 162$ ). They only represented adolescent mothers from the tertiary hospital chosen. Consequently, findings from this study are not generalizable to teenage mothers across the province.

## Recommendations

Based on the results of this study, the author has come up with the following recommendations for future research:

1. Expand population to not only teenage mothers but also to the general population of reproductive women because initiation of LARC use among different ages is specific to their distinctive social-environmental influences
2. Determine the prevalence of LARC continuation among teenage mothers
3. Explore the reasons why a number of teenagers opt for non-LARC methods, such as combined oral contraceptive pills or DMPA injection, or opt for no contraception at all
4. Explore LARC awareness among teenagers through assessment of their knowledge, skills, and attitude
5. Correlate between choice of contraceptive and social-environmental determinants such as age, gravidity and parity, educational status, socioeconomic status, sexual behavior history and influence of family, peers, and sexual partners
6. Continue counseling, motivational interviews at our Teen Mom and Family Planning Clinic, in which providers are able to discuss questions and concerns openly about contraceptive methods
7. Provide advocacy programs to address the low level of knowledge and misinformation on LARC use.

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## Conflicts of interest

There are no conflicts of interest.

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