

# Impact of Social Determinants of Health on the Choice and Use of Long Acting Reversible Contraceptives

Dani Zoorob\*, Connor McNamee, Margaret Reilly, Lindsey Loss, James VanHook

College of Medicine and Life Sciences, The University of Toledo, Toledo, Ohio, USA

Email: \*dzobgyn@gmail.com

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## Abstract

Modern women have increased options for birth control with the development of Long Acting Reversible Contraceptives (LARCs). These methods are reliable, easy to use, and require less daily maintenance while providing contraception for an extended period of time. However, despite the surge of LARCs as contraceptive options, the prevalence of unintended pregnancies is still alarmingly high in the United States. As LARCs are the most effective reversible method of birth control at preventing pregnancy, and therefore the potential social, financial, and medical complications associated, we examined whether social determinants of health play a role in LARC usage. While parity and marriage do not seem to affect LARC utilization, increased research is needed to determine the effects of race. Age can affect the type of LARC implemented, as younger women prefer implants to intrauterine devices (IUDs). Insurance coverage was an apparent influencer of LARC usage, as low out-of-pocket costs translate to increased utilization. This is linked to socioeconomic status (SES), as lower SES is associated with decreased access to healthcare in general. Increased research is needed in order to draw conclusions about the effects of education, intimate partner violence, geographic location, and other SDH on LARC usage.

## Keywords

Social Determinants of Health, Long Acting Reversible Contraceptives, Intrauterine Devices, Disparities, Race, Family Planning

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## 1. Introduction

As medicine and technology have evolved over the years, so has women's control

of their reproductive abilities. This ability has increased the possibilities of family planning, so that today's women have the opportunity to decide whether or not they will get pregnant and when to do so. For many women, the development of Long Acting Reversible Contraceptives (LARCs) has allowed this freedom. LARCs include various forms of birth control: intrauterine devices (IUDs), either copper or levonorgestrel; etonogestrel implants; or depot medroxyprogesterone. These methods are reliable and easy to use for women who do not wish to become pregnant for an extended period of time. They do not require daily maintenance and medication compliance, as oral contraceptives do, which make LARCs more effective [1]. Many LARCs provide contraceptive coverage for several years, allowing women to plan long-term for the future and taking away the stress of refilling prescriptions and taking a daily medication. Despite the surge of LARCs as contraceptive options in the United States, the prevalence of unintended pregnancies is still alarmingly high [2].

According to Jones *et al.*, the percentage of unintended pregnancies increased from 48% to 49% from 1995 to 2008 [3]. This same report showed that the rate of unintended pregnancies was lowest among non-Hispanic white women, and highest among non-Hispanic Black women. This could be partly explained by the evidence suggesting that white women had greater use of contraception than Hispanic or Black women, but the study did not further examine the type of contraception used. There is additional data that shows minority women and those from lower socioeconomic backgrounds have higher rates of unintended pregnancy [4]. This difference is likely the result of a number of factors, but may be partly due to variability in the efficacy of contraceptives used. Unintended pregnancy can be both mentally and financially stressful for a woman. This burden may be reduced by ensuring universal and equal access to these birth control methods [3].

LARCs are known to be extremely effective at preventing pregnancy; however, not much is known about its use based on social determinants with resultant potential social, financial, and medical implications. The objective of this study was to correlate the use of LARCs with select social determinants using an extensive literature search.

## 2. Methods

PubMed and OVID databases were reviewed for relevant studies LARCs cross referenced with key social determinants. The mesh words included disparities, family planning, social determinants of health, long acting reversible contraceptives, intrauterine device, etonogestrel implants, depot medroxyprogesterone, parity, marital status, age, insurance status and income level, education, and race. The database searches were without restriction on study design type or date of publication. The reference sections of the eligible articles were also analyzed for other relevant studies that may not have appeared in the literature search.

### 3. Results

Our search identified 127 records. After 5 duplicates were removed, 122 titles and abstracts were screened to yield 83 studies for full-text assessment. Sixteen articles met our pre-specified inclusion criteria. Six articles addressed each of the social determinants of parity, race, and age, whereas three tackled marital status, five addressed education, and seven focused on socioeconomic status.

### 4. Discussion

#### PARITY

Whether or not a woman has had a child can affect many facets of her life including her ability to work, irrespective of plans for having more children or not, and her current financial status. LARCs give women control over their parity and body, as they are viewed as the most effective birth control method. The current data shows that despite being an important social determinant of health, parity has little effect on LARC choice or duration of use. For example, studies suggest that being nulliparous has no effect on length of use of the IUD [5] [6]. One study looked at parity relative to duration of use of the levonorgestrel IUD and found that nulliparous women were no more likely than parous women to expel their IUD, prematurely discontinue their IUD, or have their IUD removed due to dissatisfaction or desire to become pregnant [5]. Phillips *et al.* explored the types of IUD, copper and levonorgestrel, and found that parity per se had no significant relation to IUD discontinuation or expulsion for either device [6]. In slight contrast to these studies, Sanders *et al.*, found that parity was associated with a higher 1-year continuation rate but only within the first two years of use but no impact on duration of IUD use thereafter [7]. However, it should be noted that less than half of the sample in the study had complete records of women's obstetric history and thus researchers used "multiple imputations" accounting for the data. More consistent with the literature, two additional studies found that parity had no impact on a woman's decision to choose the LARC type [1] [8]. Using a logistic regression model, Broecker *et al.* noted that parity did not have an effect on a woman's choice to use LARCs per se, whereas current birth control method and out-of-pocket expenses did [1]. When mechanical abortion and parity were assessed concurrently, no significant effect on contraceptive choice was noted whether levonorgestrel IUD, etonogestrel implant, or depot medroxyprogesterone acetate [8]. In one study assessing teenagers specifically, it was speculated that the nulliparous females might have been "prescribed" IUDs less frequently, thus accounting for their lower usage in this group [9]. However, they did not elaborate on the reasoning.

#### MARITAL STATUS

Marital status can be an important social determinant of health when choosing contraceptives. Among married couples, a partner may play a role in the family planning process, adding another confounding variable to be considered when investigating LARC usage. Additionally, some women prefer more discreet

forms of birth control, thus making implants and depo-medroxyprogesterone acetate (DMPA) more attractive options. Behringer *et al.* reported that 77.5% of women seeking an IUD were single, and 15.8% were married at the time of implant placement [5], whereas Ory *et al.* reported that 32.2% of women seeking an IUD had never been married, 47.6% were currently married and 15.1% had formerly been married [10]. This study also found similar results for women seeking DMPA, with 31.9% never married, 43.7% married and 19.6% formerly married. In contrast, Broecker *et al.* reported that the odds ratio of LARC use given married status is 1.16 as compared to LARC use given single status [1].

#### RACE

Race and ethnicity can have direct impacts on care and management of women's health, and particularly methods of contraception. These impacts can often be the result of cultural beliefs and practices, thus requiring provider familiarity with the woman's personal background and thoughts on contraception. These impressions could also come from the providers' perceptions of their patients. It has been shown that minority women are less likely to use contraceptive methods and therefore have higher rates of unintended pregnancy [4]. These disparities in health care by race likely have multifaceted causes but can have long term impacts; therefore, it is a critical topic of research with several articles investigating LARC use with regards to race and ethnicity.

A study of low-income Latina women seeking sterilization found that many of the participants simply had a lack of knowledge about IUD use, but that almost one-third of participants would be willing to consider use of one [11]. Many of these women did not seek LARCs because of personal misconceptions or worries that the IUD would not stay in place or would change their menstrual cycle. However, it was also noted that the publicly funded clinics these women attended often did not offer LARCs due to cost—which clearly hinders access. If not considering IUDs, Singh *et al.* reported that Hispanic and American Indian women were more likely than non-Hispanic white women to choose DMPA for their postpartum contraception [12]. Other studies have shown that Black women are less likely to choose an IUD, and were more likely to choose implants [8] [13]. However investigating what is given as recommendations per se, providers seem ed more likely to suggest IUDs to Black women compared to white women ( $p = 0.04$ ) [4]. In this study, there was a significant difference in recommendations of IUDs for white women of varying SES, but that difference was not significant in Black women. Race and ethnicity did not appear to have as much of an effect on recommendations by providers when the women were of higher SES. Finally, when investigating continuation rates associated with race Black race was associated with higher discontinuation of IUD use [6].

#### AGE

Age can be an important factor in health care: from influencing the decisions an individual makes to what their providers feel is appropriate based on their age. While this can be beneficial, there has been debate about when it is appropriate to start younger women on birth control, especially LARCs. Overall, there

is a wide array of data when looking at the impact of age on LARC use. Broecker *et al.* suggested that age had no significant relation to the decision to use LARCs [1]. Regarding LARC type, two articles suggested that implant users tended to be younger than DMPA and IUD users [7] [8]. Levonorgestrel IUD users have been found to be younger than copper IUD users [7] [9]. Of copper IUD users, younger women had higher discontinuation rates, but the levonorgestrel IUD users' discontinuation rates were the same across all age groups [9]. Similarly, Phillips *et al.* found that copper IUDs were more frequently discontinued by their younger users, but younger women were more likely to discontinue their levonorgestrel IUDs, although less so than young women with copper IUDs [6]. Two articles found that younger women were not any more likely to expel their IUDs than older women [5] [6]. When considering older women who use LARCS, Sanders *et al.* reported that they were more likely to maintain their IUD use for a minimum of two years at a time [7]. Regarding discontinuation, two studies associated the reason in younger women as having more side effects from their IUDs, including dysmenorrhea, amenorrhea, and intrauterine pregnancy, as well as higher removal due to concern for PID [9]. However, these women did not effectively have higher rates of PID, and age by itself had no impact on discontinuation rates [5]. Thus, studies indicate that age has an impact on the type of LARC chosen and discontinuation rate of IUDs, but not on expulsion of IUDs.

#### HEALTH INSURANCE AND SOCIOECONOMIC STATUS

Lack of insurance is often been linked to altered patterns of management and treatment. Lack of coverage for many is due to affordability and income. Additionally, limitation in contraception coverage benefits may hamper LARC access in patients with otherwise satisfactory health care insurance coverage. Because of the higher reliability rates and potential long-term expenditure of rearing children, LARCs are viewed as good contenders for prolonged prevention of accidental conception. When analyzing the literature, several articles investigated the relation of LARC usage with insurance and income levels, often in the context of SES. These studies typically showed an increase in LARC usage when direct personal cost was low, either due to insurance coverage or because the clinic provided LARCs for free to study participants. A study done in an Appalachian private practice showed that out-of-pocket cost for an IUD is inversely proportional to the likelihood of women to choose LARCs as their method of birth control. Women with private insurance and out-of-pockets costs of \$200 or greater had a significantly decreased rate of IUD placement, whereas women on Medicare received the device for free and had a placement rate of 78.2% [1]. The placement rate of women with private insurance and out-of-pocket costs lower than \$200 was 86.6%. Another study corroborated these findings and documented the higher initiation rates in trials where women had access to LARCs without cost [14]. In a study assessing women enrolled in the United States military health-care system, lower income was associated with increased LARC usage in the absence of out-of-pocket costs [15]. This suggests that more women would likely

choose and initiate LARC use if the burden of cost was diminished through increased insurance coverage. However, coverage in itself was not the only hindrance. A study conducted in an urban academic gynecology practice reaffirmed that high out-of-pocket expenses discourage and sometimes prohibit women from receiving IUDs—even for women with private insurance [16]. It suggested that out-of-pocket expenses less than \$50 per IUD were associated with higher placement. However, the same study reported that only 25% of women who had requested an IUD actually received one. This could likely be explained by Dehendorf *et al.*'s study investigating provider recommendations for intrauterine contraception where it was found that that providers may be less likely to recommend IUDs to low SES white women because of the physician perceptions [4]. The study reported that a perceived higher risk of STIs was associated with IUD use, and thus increased complications with IUDs such as infertility. However, this finding was not noted in lower SES Black and Latina women *per se*. The same study further implied that with women of higher SES, providers did not have a bias to race or ethnicity. This implies that SES may be of higher importance to providers when suggesting LARC types.

Continuation rates of LARCs also correlated with income and insurance. A study done with University of Utah Healthcare System showed that insurance status of self-pay or public payer at insertion of an IUD or implant was associated with 2-year continuation of the method [7]. Another study had a very limited focus on SES, insurance, and income levels, but found implant use to be associated with lower income and public insurance, although public insurance was also associated with increased LARC discontinuation [13]. The paucity of available studies demonstrates the need for more research in this area.

#### EDUCATION

Education has been shown to be a social determinant affecting healthcare decisions and outcomes. Measures of education include both the formal education attained by a patient and the counseling received from medical staff. Five articles from our literature search pertained to education. Of these, four examined a woman's years of formal education and her LARC use. Three articles described the relation between the counseling given to women and resultant uptake of LARCs. Formal education was inconsistently associated with LARC use. Broecker *et al.* found the odds ratio of education level to LARC use was 0.89 [1]. Philips *et al.* found that among IUD users, 49.3% had an education level above college, while 2.8% had a below high school education level. The study also suggested that education was not associated with early discontinuation of an IUD [6]. When assessing correlations between abortion, education, and all LARCs; Steinauer *et al.* found 69.2% of participants who chose to use LARCs following aspiration abortion had high-school level of education or higher [8]. However, one study did suggest that increasing education correlated with lessened likelihood of choosing DMPA specifically [12].

Counseling was associated with increased LARC uptake. White *et al.* reported that in specific populations of Latina women, disinterest in LARC use is due to

“fears and misperceptions about method insertion and removal” and “a limited understanding of reproductive physiology and hormonal methods’ mode of action” [11]. Another study suggested that “continuation rates [of IUD use] may be higher in the setting of improved counseling” [6]. Steinauer *et al.* also found that women receiving an IUD or implant were more likely to rate their counseling by providers as “helpful”, reflecting a “lower awareness” of IUDs and implants [8]. Thus, counseling patients of all SES and ethnicities is important for consideration of LARCs in their birth control repertoire.

#### RECOMMENDATIONS

The relative lack of research into social determinants of health with a focus on LARC usage represents an important possibility for future research. However, this literature review demonstrates that insurance coverage and race play major roles in women choosing a LARC. The limited information on age and education seems to indicate that there is a correlation between each of these factors and LARC usage; however, these are areas where more research is needed. Parity and marriage do not seem to have impact on LARC usage. There are many other important social determinants of health which have yet to develop a large presence in the literature regarding LARC usage. For instance, geographic location can greatly influence access to healthcare, and therefore access to LARCs. Furthermore, hunger status remains as a vague entity that is yet to be addressed in this field. Also, intimate partner violence is an important consideration for healthcare workers seeking to provide family planning abilities to women, yet it is almost nonexistent in the literature’s discussion of LARCs.

## 5. Conclusion

Unplanned pregnancies can cause women a great deal of stress, both financially and mentally, thus demonstrating the importance of ensuring that as medical technologies evolve, all women have access to the most effective methods of family planning. Based on the aforementioned, there is a paucity of information tackling social determinants and long-acting contraceptives. Additional studies to identify more robust links are suggested, especially while including data retrieved from expanded search criteria as well as search engines such as Embase, Scopus, Web of Science Core Collection, and Cochrane Library would be ideal.

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## Key Message

There is relatively sparse research about LARC usage from a social determinant standpoint. This initial literature review demonstrates that while certain SDH like race and insurance coverage may have effects on LARC utilization, others still require further investigation.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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## Abbreviations

LARC: long acting reversible contraceptives

IUD: intrauterine devices

DMPA: depo-medroxyprogesterone acetate

SDH: social determinants of health

SES: socioeconomic status