PRINT ISSN 1119-8362
Electronic ISSN 2659-1499

Full-text Available Online at
https://www.ajol.info/index.php/jasem
https://www.bioline.org.br/ja

J. Appl. Sci. Environ. Manage.
Vol. 28 (10) 3103-3110 October, 2024

Knowledge, Attitude and Age Factors Affecting the Use of Long Acting Reversible Contraceptives among Postgraduate Students at a Tertiary Institution in Greater Manchester, England, UK

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ABSTRACT: Long-acting contraception (LARC) is the utmost effective form of reversible birth control methods and there are to main types which include the intrauterine device (IUD) and the birth control implant. The objectives of this paper was to investigate the knowledge ,attitude and age factors of long acting reversible contraceptives (LARC) among postgraduate students at a tertiary institution in greater machester, England, UK using an online participatory survey,opned to the general public through internal email and social media (Twitter, WhatsApp, Facebook). Targeting 322 female postgraduate students between 21-50 years. However, only 50 participants took part in the survey due to the limitations posed by COVID-19 pandemic. The results showed that there were more participants between 31-40 years (42.9%), more married women (49.0%), more Christians (59.2%), and an equal number of White and black Africans (44.9%). The percentages of women who have heard about LARC include; implants (87.8%), injectables (85.7%), Intrauterine devices (72.9%), and hormonal intrauterine system (58.3%). Some of the participants showed positive attitudes towards LARC, while majority of the participants would not use LARC because of the side effects. Most of those who have used implants and injectables were women between 21-30 years, and older women have used intrauterine devices more than the younger age group. Some barriers to the use of LARC include; Side effects of LARC (63.8%), Interference with the body's processes(63%), and lack of knowledge about different methods available(54.3%),having a foreign object in their bodies (59.1% for injectables) and (53.2% for implants)

DOI: https://dx.doi.org/10.4314/jasem.v28i10.19

Cite this Article as: OLANIYI, A. O; OGBE, K. U; OLANIYI, H. I. (2024). Knowledge, Attitude and Age Factors Affecting the Use of Long Acting Reversible Contraceptives among Postgraduate Students at a Tertiary Institution in Greater Manchester, England, UK. *J. Appl. Sci. Environ. Manage.* 28 (10) 3103-3110

Dates: Received: 11 July 2024; Revised: 19 August 2024; Accepted: 21 September 2024 Published: 05 October 2024

Keywords: Unintended pregnancy; intrauterine device; public health issues; Long Acting Reversible Contraceptives.

Unintended pregnancy is a major public health issue globally because it has a high prevalence both in developing and the developed world, dueII to non-use and misuse of contraceptives (Public Health England [PHE], 2018; World Health Organization [WHO], 2020). It is a pregnancy that occurs either when no child or children are desired (unwanted) or when it was not expected (mistimed) (Centre for Disease Control

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and Prevention [CDC], 2015). WHO, 2019 reported that 44% of pregnancies among women (15-44 years) globally were unintended (Bearak *et al.,* (2020). The rate of unplanned pregnancy is higher in developing countries (65 per 1000 women) compared to developed countries (45 per 1000 women) (Bearak, Popinchalk, There are various outcomes of unintended pregnancies, which affect both mother and child, such as induced abortion, malnutrition, illness, cycles of high fertility, lower educational and employment potential, poverty, abuse and neglect, Induced abortion and death (Logan *et al.,* 2007; WHO, 2019; National Institute for Health and Care Excellence [NICE], (2019). Induced abortion, which is the termination of pregnancy before the age of viability, is one of the most dangerous consequences of unintended pregnancy because of the mortality rate (Bearak, 2020).

Studies have shown that women who seek induced abortion do not use contraceptives adequately (Azage, 2020). Globally, 62% of women within reproductive age (15-49) use family planning, and 56% use modern methods such as pills, intrauterine devices, implants, injectables, sterilisation (Population Reference Bureau.(2019). Also, a Demographic and Health Survey data from 47 countries (low-income and upper-middle income) conducted recently by Moreira, *et al*. (2019), showed that 40.9% of women in need of contraception were not using any contraceptive methods to avoid pregnancy. Most of these women are predisposed to unintended pregnancy because they are not using the modern contraceptives. This assertion is true because the use of modern contraceptives in 2017 was shown to have prevented about 308 million unintended pregnancies, and meeting all women's need for modern methods of contraception would avert an additional 67 million unintended pregnancies annually (WHO, 2019). Furthermore, most women who use contraceptives that depend on the consistency of users, such as oral contraceptives, find it difficult to take their medications appropriately because they do not remember to use it consistently (Pazol *et al*., 2018).

One of the causes of induced abortion is the incorrect use of contraceptives among women in the UK (Royal College of Obstetricians and Gynaecologists [RCOG] (2019). There are approximately 1.9 billion women of reproductive age group (15-49 years) worldwide in 2019, and 1.1 billion have a need for family planning; 842 million are using contraceptive methods, and 270 million have an unmet need for contraception (United Nation[UN], 2019). Also, many women in the reproductive age group do not use contraceptives because of gaps in knowledge of their efficacies and misconceptions about their side effects (refs needed here). Evidently, helping people to choose the method of contraception that suits them best, and increasing their awareness and access contraceptives, will help to reduce unplanned pregnancies (French, and Saxena, 2020).Therefore, the objective of this paper was to investigate the knowledge, attitude and age factors of long acting reversible contraceptives (LARC) among postgraduate students at a Tertiary Institution in greater Manchester, England, UK

MATERIALS AND METHODS

Study Design: This study is a quantitative study design, which comprises a descriptive (or non-analytical) cross-sectional survey on the knowledge, attitudes on the use of LARC among women. This design is appropriate for this current study because a quantitative design deals with an objective measurement and statistical analysis of data collected through questionnaire or survey, and it focuses on gathering numerical data to explain a particular phenomenon (Aggarwa, and Ranganathan, 2019).

Study setting: The setting for this study was online, and the study was carried out among female postgraduate students in the University of Salford: the survey was opened to the general public through internal emails to postgraduate programme leaders and social media (Twitter, Facebook).

Sampling methods: The sampling method for this study was a convenience sampling because an unrestricted, self-selected online survey was sent to many students (Fricker, 2016).

Step-By-Step Method of Collecting Data: The data for this study was collected through an online survey distributed to postgraduate students at the University of Salford. The online survey was designed with JISC survey: an online survey tool that is provided by the University of Salford IT department, designed to create and distribute questionnaires. Participants were recruited by means of various methods, including social networking sites. Furthermore, an email was sent to postgraduate programme leaders and supervisors by the researcher's supervisor. The link to the survey was sent to the blackboard site of all the female postgraduate students, furthermore, advertisements were also placed on Twitter and Facebook and encouraged to be shared amongst other University of Salford female students. The questionnaire used to design the online survey was adapted from the studies conducted by Davison and Majumder, (2017) and, however, it was modified and changed for the area specific setting, and the research objectives.

Data Analysis: The sample data were analysed using Chi-square to test the associations between some variables. The p value obtained for different analysis were used to make the decision rule, and to determine if the associations were statistically significant or not. If the p value was less than 0.05, the null hypothesis will be rejected, and the alternative hypothesis will be accepted.

RESULTS AND DISCUSSION

Demographic characteristics of the participants: The distribution of the participants by their age groups is shown in Table 1, and the most common age-group was 31-40 (42.9%). All the respondents were female, and the percentages of their marital statuses were: single (44.9%), married/civil partnership (49.0%), and separated /others (6.1%). They were predominantly White (44.9 %) and Black African (44.9%), and the remaining participants were categorized as "other" (10.2%). Also, 58.0% of the participants were Christians, 30% said that they did not have any religion, and 8% and 4% of the participants were Muslims and Hindus respectively.

Contraceptives Knowledge/ Use: Among the user dependent contraceptives, female condom (100%) and oral contraceptives (98%) have the highest positive responses to the question "Have you heard about the following contraceptive methods. (Table 2). For the LARC, 87.80% and 85.7% of the participants had heard about implants and injectables respectively (Table 2).

As regards the use of contraceptives (previous/current user), (49.0%) of the respondents, which was the highest percentage reported to have used oral contraceptives before. the percentages of those who have used implants and intrauterine devices; 16.3% and 14.6% respectively

Table 1: Clustered characteristics of the participants (n=49)

	Characteristics	Number (%)
Age group	21-30	20 (40.8)
	31-40	21(42.9)
	41-50	8(16.3)
Marital status (n=49)	Single	22 (44.9)
	Married/ civil partnership	24(49)
	Others	3(6.1)
Ethnicity (n=49)	Whites	22 (44.9)
	Black African	22(44.9)
	Others	5 (10.2)
Religion	Christianity	29 (59.2)
	No religion	15 (30.6)
	Muslim	3(6.1)

Table 2: Contraceptive knowledge and use among the participants based on their responses to Have you heard about the following contraceptive methods

Contraceptives (user dependent	Yes	No	Previous User
Female condom (n=46)	45(100)	0(0)	1(2.1)
Oral contraceptives (n=49)	48(98.0)	1(2.0)	24(49.0)
Withdrawal method n=48	47(97.9)	1(2.1)	10(20.8)
Male condom (n=48)	47(97.9)	1(2.1)	15(30.6)
Emergency contraceptive (n=47)	44(93.60)	3(6.4)	9(18.8)
Abstinence (n=47)	44(89.8)	3(6.1)	3(6.4)
Female/male sterilization (n=47)	43(91.5)	4(8.5)	1(2.1)
Vaginal ring (n=44)	28(63.6)	16(36.4)	0(0)
Contraceptive patches (n=48)	38 (79.2)	10	1(2.1)
Natural method (n=45)	37(82.2)	8	6(13.3)
Diaphragm (n=45)	36(80.0)	9	0(0)
Rhythmmethod (n=43)	16(37.2)	27	1(2.3)
Lactational Amenorrheal (LAM) (N=44)	14(31.8)	30	2(4.4)
	Long Acting Reversible	Contraceptive (LARC)	
Injectables,(n=49)	42 (85.7%)	7(14.3%)	6(12.2%)
Intrauterine devices(n=48)	35(72.9%)	13(27.1%)	7(14.6%)
Hormonalintrauterine system(n=48)	28(58.3%)	20(41.7%)	5(10.4%)
Implants(n=49)	43(87.80%)	6(12.2%)	8(16.3%)

LARC use by age group: Comparing the relationship between age and LARC use, the highest percentage of injectables users (6.1%) were women between 21-30 years as illustrated in Table 3. Also, 6.3% of the participants, who have used or currently using intrauterine devices and hormonal intrauterine systems are women within the 41-50 age group.

For implants, 10.2% of the participants, which was the highest percentage in the cohort (10.2%, 4.1%, and 2.0%), were women between 21-30 years. However, a significant association was noted only between hormonal intrauterine system users and age group (p=0.009) (Table 3).

Attitude Of Women Towards Contraception: Out of the eleven factors (Table 4) that show the attitudes of women towards contraceptives, effective protection against pregnancy (n=42; 85.7%) had the highest percentage.

Table 3: Age differences among LARS users

Contraceptives	**Age-group**	**Previous/ current user. No (%)**	**Non-user. No (%)**	**Total No (%)**
Injectibles (p=0.855 ;n=49)	21-30	3 (6.1%)	17(34.7)	20 (40.8)
	31-40	2(41.1)	19 (38.8)	2142.9)
	41-50	1(2.0)	7(14.3)	8(16.3)
	Total	6(12.2)	4387.8)	49(100)
Intrauterine devices p=0.101; n=48	21-30	2 (4.2)	18(37.5)	20(41.7)
	31-40	2 (4.2)	19(39.6)	21(43.8)
	41-50	3(4.2)	4(8.3)	714.6)
	Total	7(14.6)	41(85.4)	48(100)
Intrauterine system	21-30	0(0)	20(41.7)	20(41.7)
	31-40	2(4.2)	19(39.6)	21(43.8)
	41-50	3(6.3)	4(8.3)	7(14.6)
IMPLANT (P=0.404; N=49)	21-30	5(10.2)	15(30.6)	20(40.8)
	31-40	2(4.1)	19(38.8)	21(42.9)
	41-50	1(2.0)	714.3)	8(16.30
	Total	8(16.3)	41(83.7)	49(100)

Table 4: How much would each of the following factors affect your decision about using a contraceptive method?

	Age-Group	None	Very little	Some	A lot	Total
Effective protection	21-30	2(4.1%)	0(0%)	1(2.0%)	17(34.7%)	20(40.8%)
against pregnancy)	31-40	0(0%)	1(2.0%)	1(2.0%)	19(38.8%)	21(42.0%)
(n= 49; p=0.478)	41-50	1(2.0%)	0(0%)	1(2.0%)	6(12.2%)	8(16.3%)
	Total	3(6.1%)	1(2.0%)	3(6.1%)	42(85.7%)	49(100%)
Effective protection	21-30	4(8.5%)	1(2.1%)	6(12.8%)	8(17.0%)	19(40.4%)
against STIs	31-40	6(12.8%)	1(2.1%)	4(8.5%)	10(21.3%)	21(44.7%)
	41-50	3(6.4%)	0(0%)	0(0%)	4(8.5%)	7(14.9%)
(p=0.707; n=47)	Total	13(27.7%)	2(4.3%)	10(21.3%)	22(46.8%)	47(100%)
Possible weight gain	21-30	1(2.1%)	0(0%)	8(16.7%)	10(20.8%)	19(39.6%)
as a side effect	31-40	0(0%)	2(4.2%)	3(6.3%)	16(33.3%)	21(43.8%)
(p=0.075; n=48)	41-50	1(2.1%)	1(2.1%)	3(6.3%)	3(6.3%)	8(16.7%)
	Total	2(4.2%)	3(6.3%)	14(29.2%)	29(60.4%)	48(100%)
Possible reduction	21-30	1(2.1%)	0(0%)	7(14.6%)	11(22.9%)	19(39.6%)
in libido. (p=0.066;	31-40	1(2.1%)	2(4.2%)	2(4.2%)	16(33.3%)	21(43.8%)
n=48)	41-50	0(0%)	2(4.2%)	3(6.3%)	3(6.3%)	8(16.7%).
	Total	2(4.2 %)	4(8.3%)	12(25.0%)	30(62.5%)	48(100%)
Likelihood of	21-30	1(2.1%)	2(4.2%)	4(8.3%)	13(27.1%)	20(41.7%)
affecting mood	31-40	1(2.1%)	2(4.2%)	7(14.6%)	10(20.8%)	20(41.7%)
(p=0.581; n=48)	41-50	1(2.1%)	0(0%)	5(31.3%)	2(8.0%)	8(16.7%)
	Total	3(6.3%)	4(8.3%)	16(33.3%)	25(52.1%)	48(100%)
Likelihood of	21-30	1(2.0%)	2(4.1%)	6(12.2%)	11(22.4%)	20(40.8%)
bleeding (p=0.581;	31-40	1(2.0%)	0(0%)	6(12.2%)	14(28.6%)	21(42.9%)
n=48)	41-50	1(2.0%)	1(2.0%)	3(6.1%)	3(6.1%)	8(16.3%)
	Total	3(6.1%)	3(6.1%)	15(30.6%)	28(57.1%)	49(100%)
Insertion/removal	21-30	2(4.2%)	1(2.1%)	7(14.6%)	10(20.8.3%)	20(41.7%)
procedures	31-40	1(2.1%)	3(6.3%)	10(20.8%)	7 (14.6%)	21(43.8%)
(p=0.581; n=48)	41-50	0(0.0%)	2(4.2%)	2(4.2%)	3(6.3%)	7(14.6%)
	Total	3(6.3%)	6(12.5%)	19(39.6%)	20(41.7%)	48(100%)
Ease of use	21-30	2(4.2%)	0(0%)	3(6.3%)	15(31.3%)	20(41.7%)
(p=0.128)	31-40	1(2.1%)	4(8.3%)	2(4.2%)	14 (29.2%)	21(43.8%)
(n=48)	41-50	0(0.0%)	0(0%)	3(6.3%)	4(8.3%)	7(14.6%)
	Total	3(6.3%)	4(8.3%)	8(16.7%)	33(68.8%)	48(100%)
Acceptance of	21-30	5(10.2%)	5(10.2%)	2(4.1%)	8(16.3%)	20(40.8%)
partner to method	31-40	4(8.2%)	5(10.2%)	4(8.2%)	8(16.3%)	21(42.9%)
	41-50	0(0.0%)	1(2.0%)	3(6.1%)	4(8.2%)	8(16.3%)
(p=0.550; n=49)	Total	9(18.4%)	11(22.4%)	9(18.4%)	20(40.8%)	49(100%)
Interference with	21-30	1(2.0%)	5(10.2%)	2(4.1%)	12(24.5%)	20(40.8%)
sex (p=0.905)	31-40	1(2.0%)	4(8.2%)	3(6.1%)	13(26.5%)	21(42.9%)
(n=49)	41-50	1(2.0%)	1(2.0%)	2(4.1%)	4(8.2%)	8(16.3%)
	Total	3(6.1%)	10(20.4%)	7(14.3%)	29(59.2%)	49(100%)
Moral/religious	21-30	16(33.3)	24.2(4.2)	2(4.2)	0(0.0)	20(41.7)
beliefs	31-40	11(22.9)	1(2.1)	2(4.2)	6(12.5)	20(41.7)
(p=0.158;n=48	41-50	4(8.3)	0(0.0)	2(4.2)	2(4.2)	816.7)
	Total	31(64.6)	3(6.3)	6(12.5)	81(6.7)	48(100)

Also, the following factors would affect their decision of the participants 'A Lot" about choosing contraceptives; ease of use (n=33; 68.8%), possible reduction in libido (n=30; 62.5%),possible weight gain as a side effect (n=29; 60.4%), interference with sex (29; 59.2%), likelihood of bleeding (n=28; 57.1%), and likelihood of affecting mood(n=25, 52.1%) were also predominant reasons why they would choose any contraceptive. Moral/Religious beliefs was reported by 64.6 %(n=31) not to have any effect on their choices for a contraceptive Most of those who believed that the factors highlighted in table 4 have "a lot" of effects on their choices for contraceptives are women between 31-40 years. However, some women between 21-30 years would consider the effects of contraceptives on their moods before choosing contraceptives, although these relationships are not statistically significant (p>0.005)

*Knowledge and Awareness of Students about All Common Methods of Contraception with a Special Emphasis on LARC:*For the LARCs, a very high proportion of the participants have heard about Implants, evidenced by the number of participants who knew more implants (87.8%) and injectables (85.7%) compared to Intrauterine devices (72.9%), and hormonal intrauterine system (58.3%). This is consistent with the findings of Bharadwaj *et al*. (2012), where majority of the participants displayed awareness of LARC. Also, Bharadwaj *et al*., 2012 also showed that as regards knowledge, implants have the highest percentage of those who have heard about it (95%), and the percentage of those who have heard about injectables and intrauterine contraceptives were 80% and 71% respectively. Also, implants have been shown to be the most common type of LARC in the UK (NICE, 2019; Statista, 2020), and outside the UK (Tibaijuka *et al*., 2017). However, Davison and Majumder, (2017) reported that intrauterine devices knowledge was the highest among the participants of the study they conducted among students.

Attempts have been made why implants are the most popular and most commonly used among all the LARC methods (Hatcher, 2007; NICE, 2019).

This study measured the level of knowledge of the participants based on their awareness of the method, which was consistent with the study conducted by Davison andMajumder, (2017). However, a better method of accessing knowledge would be more accurate (Bharadwaj *et al*., 2012), as seen by studies in the USA on knowledge about some LARC methods (Hoopes *et al*., 2016) The researcher used a 11-question true/false test to access knowledge of the participants about LARC, and the Knowledge score was the number of correct answers out of 11 questions (Bachorik, 2015; Hoopes *et al.,* 2016). All these questions used by the researchers were on the characteristics of LARC (Bachorik, 2015).

The knowledge of the participants about LARC was also accessed in this study based on the self-reported knowledge about contraceptives, and how much they know about their potency against pregnancy protection. It was discovered 59.1% of the participants knew most about intrauterine device and intrauterine system, and 26.5% of them were between 21-30 years. Also, 24.5% out of 57.2% of the participants who knew about injectables were also between 21-30 years, although the association between the age groups and knowledge were not statistically significant (p=0.409 and p=0.824 respectively). This approach used to determine the knowledge has also been used by some researchers, who accessed the knowledge of women on the ability of LARC to protect against STI, side effects associated with LARCs, and their experiences with LARC in the UK(Davison and Majumder, 2017), and outside the UK (Jabeen and Umbreen, 2016). Generally, participants in this study showed a high level of Knowledge based on their awareness about the methods, and their knowledge about the ability of LARC to prevent unintended pregnancy.

Attitudes of Students to LARC: The attitudes of women toward LARC was determined based on the responses of the participants to eleven questions asked in the questionnaire.These questions and similar questions have been used by other researchers to determine the attitude of women towards LARC in the UK (Davison and Majumder, 2017), and other parts of the world (Anguzu *et al.,* 2014). Out of the eleven factors that show the attitudes of women towards contraceptives, effective protection against pregnancy had the highest percentage (85.7%). Other important factors that had high percentages were ease of use (68.8%), possible reduction in libido (62.5%), possible weight gain as a side effect (60.4%), and interference with sex (59.2%). Davison and Majumder, (2017) found that Participants indicated that efficacy of contraception, STI protection, and ease of use were the most important considerations when choosing a contraceptive.

The attitudes of women towards LARC in this study was also determined based on the responses of the participants to "which side effects do you associate with each of the following long-acting contraceptive methods". Since most women do not understand the exact side effects of LARC, their attitudes can be interpolated from the side effects they believe may be caused by LARC. Most of the participants in this study rightly believed that all the four LARC methods do not

offer any protection against (STIs) (61.7%, 57.4%, 61.4%, and 59.6%). Also, intrauterine devices, hormonal intrauterine system, and implants were associated with painful insertion or removal process, half of the participants believe that hormonal intrauterine system cause irregular periods, and a large percentages(63.8%, 51.1%, 50.0%) of the participants believe that injectables, implants, and hormonal intrauterine system respectively cause weight gain.

These findings are similar to the reports of Bharadwaj*et al*. (2012) and Bracken & Graham, 2014, where most of the researchers associated multiple negative side effects with LARCs. Some of the perceived negative effects of LARC on women (effect on their future fertility and weight gain), outweigh the advantages of LARCs such as high efficacy, user-independence, and non- interference with sexual intimacy **(**Bharadwaj*et al*., 2012**).** However, Davison and Majumder, (2017) reported that students within their study associated LARC with few side-effects – mainly lack of STI protection, and uncomfortable/painful insertion or removal process caused by intrauterine devices and injection. The attitudes of women towards LARC exhibited by the participant in this study could be due to the high level of knowledge about LARC. Apparently, women who were poorly informed about LARC, had firm but incorrect beliefs about their safety and side effects, and they disliked any method which involved an invasive procedure and/or vaginal examination(Bharadwaj*et al*., 2012) .Bracken and Graham, (2014) found that a significant number of the participants in their studies would also chose LARC because of their reliability.

This study also showed that some of the participants (36% and 34%) have positive attitudes to injectables and implants respectively, and they might use them because they know women who have used them successfully, which is also similar to the reports of Bharadwaj*et al*. (2012). Also, some women (34%) affirmed that they would use injectables because they do not need to think about contraceptives for 12 weeks. Conversely, Bharadwaj*et al.* (2012) also showed that most women would prefer implants to injectables and intrauterine contraceptives (p=0.002 and p=0.001 respectively) because of the longer duration of action (3-5 years) of implants. Conclusively, while some women in the study showed negative attitudes towards LARC by their responses to the questions in the survey highlighted above, a significant percentage of the participants showed positive attitudes by admitting that they would use LARC because of their advantages over other methods of contraception.

Age As A Predictive Factor For LARC Use: Age has been shown to determine the method of contraceptives used by women (Allerton, and Brechin, 2014; Davison and Majumder, 2017). This study found out that 10.2% of the participants who have used implants were between 21-30 years, compared to 4.1%, and 2.0% who belong to the age groups; 31-40 and 41-50 respectively. Also, the highest percentage of injectables users (6.1%) were women between 21-30 years. However, 6.3% of the participants, who have used or currently using intrauterine devices and hormonal intrauterine systems were women within the 41-50 age group. The associations between age group and LARC were not statistically significant for injectables, Intrauterine devices and implants (p=0.855, p=0.101, and p=0.404 respectively), but it was significant for hormonal intrauterine systems (p=0.009). This finding is similar to the reports of Cameron *et al.* (2012), who asserted that teenage women have more tendency of choosing implants than women above 35 years, and older women were eight times more likely than their teenage counterparts to choose intrauterine devices/hormonal intrauterine systems.

These results suggest that young people would prefer implants and injectables to intrauterine device and hormonal intrauterine systems. To buttress these assertions, implants are considered to be more suitable for women aged 20-24 years because of their sexual lifestyles, which require a very reliable contraception (Allerton, and Brechin, 2014). Although all the long acting methods have been shown to be effective (NICE, 2019), Implants and injectables are considered to be suitable for all age groups. (Guillebaud, 2019) compared to intrauterine devices and hormonal intrauterine system.

To explain why implants and injectables are more acceptable by the young age group, Bracken & Graham, (2014) showed that young women had negative attitudes towards intrauterine device and hormonal intrauterine systems. Also, implants have gained more credence among young women because of the long duration of action (Bank, 2019). The actual reason for these observations could not be ascertained from the study, but possible reasons for this high uptake of implants among younger women(under 25) could be; the belief that implants and injectables are effective for all age groups, and the fact that implants and injectables are the most commonly prescribed LARC methods (Guillebaud, 2019; Statista, 2020). Also, it can be deduced from some studies (Davison and Majumder, 2017; French *et al*., 2020) that young people (<40 years) use LARC more than older women (>40), who are most likely closer to menopause and may be less sexually active.

Also, this study also found out that women who are between 21-30 and 31-40 believe that injectables offer a lot of protection against pregnancy. Although the protection against unintended pregnancy provided by intrauterine devices/hormonal intrauterine system and implants are similar, older women may likely prefer intrauterine devices/hormonal intrauterine system (Lewis *et al*., 2010). In addition, this current study has found a significant relationship between age and long term use of other methods($p=0.008$), and lack of required skill($p=0.042$) to administer LARC because most of those who reported that the factors have "a lot " of effects on the choice of LARC were between the age of 31-40($p<0.005$)(Table 4).

Conclusion: To the best of my knowledge, this study has answered part of the research questions on how much women know about LARC, their attitudes towards long acting methods, and the facilitators and barriers to the use of LARC. It is obvious from the results that many women have heard about Implants, intrauterine devices, and injectables, and they know about the efficacy of LARCs but that is not adequate enough to conclude that they have an accurate knowledge about LARC. As regards the attitudes of women towards LARC, the conclusions made on the attitudes of women based on their responses to some questions on the characteristics of LARC could not give an objective presentation of all the negative and positive attitudes of women towards LARC.

*Declaration of conflict of interest:*The authors declares no conflict of interest

Data Availability Statement: Data are available upon request from the first author or corresponding author

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