

# Long-acting reversible contraceptive practices in northern portuguese primary health care: cross sectional study

## Práticas de contraceção reversível de longa duração nos Cuidados de Saúde Primários do Norte de Portugal: estudo transversal

Maria João Marques Reis<sup>1</sup>, Luísa Sá<sup>2</sup>

Faculdade de Medicina da Universidade do Porto; Unidades de Saúde da ARS Norte

### Abstract

**Overview and Aims:** LARCs (long-acting reversible contraceptives) are long-term contraceptives suitable for all women, not dependent on use, with high contraceptive efficacy, satisfaction, and continuity by users. In Portugal, LARCs are free of charge in Primary Health Care and their placement is part of the family physicians' skills. The present study aimed to characterize contraceptive practices and LARCs prescribing and placement in the Northern Regional Health Administration of Portugal.

**Study Design:** Cross-sectional study.

**Population:** Specialists and trainees family physicians from Northern Portuguese Primary Health Care

**Methods:** We used a non-random, "snowball" sample, disseminated via social networks and supported by health care institutions and professional organizations.

**Results:** We obtained a sample of 167 participants, corresponding to 5.9% of the Northern Portuguese Primary Care family physicians, which represents 26.2% of the health units and 23 of the 24 Groups of Primary Care Centres of this region. Estroprogestative pills lead the contraceptive recommendation (84,4%; 95%CI: 78,5% - 89,8%), followed by LARCs (21,6%; 95%CI: 15,6% - 28,1%). The subcutaneous implant was the most recommended (74,9%; 95%CI: 68,3% - 80,8%) and placed LARC (70,7%; 95%CI: 62,9% - 77,8%). Most family physicians do not place Intrauterine contraceptives (59,9%; 95%CI: 52,1% - 67,1%), opting to refer to a gynecologist. The subcutaneous implant tends to be recommended for nulliparous ( $p < 0,001$ ) and Intrauterine contraception for multiparous women ( $p < 0,001$ ).

**Conclusions:** There is a paradigm shift in contraception in Northern Portuguese Primary Health Care, with the increased use of LARCs. In this region, subcutaneous Implant represents the most commonly used LARC, opposing the global tendency where Intrauterine contraception is the LARC of choice. Intrauterine LARCs appear to be more dependent on external barriers than family physicians competence. Apart from decreasing hospital referrals, improving LARC placement conditions could optimize the use of Intrauterine contraception and users' sexual health.

**Keywords:** Contraceptive devices; Contraceptive agents; Long-acting reversible contraception; Primary Health Care.

### Resumo

**Introdução e objetivo:** Os LARC (long-acting reversible contraceptives) são anticoncepcionais de longa duração, adequados a todas as mulheres, não dependentes de uso, com elevada eficácia contraceptiva, satisfação e continuidade pelas utilizadoras. Em Portugal, os LARCs são gratuitos nos Cuidados de Saúde Primários e a sua colocação faz parte das competências dos médicos de família. Este estudo pretendeu caracterizar as práticas contraceptivas e o perfil de prescrição e colocação de LARCs na Administração Regional de Saúde do Norte de Portugal.

**Desenho do estudo:** Estudo observacional transversal.

**População:** Especialistas e Internos de formação específica em Medicina Geral e Familiar dos Cuidados de Saúde Primários da região Norte de Portugal.

**Métodos:** Foi utilizada uma amostra tipo “bola de neve”, divulgado através de redes sociais e apoiado por instituições de saúde e organizações profissionais.

**Resultados:** Obtivemos uma amostra de 167 participantes, correspondente a 5,9% dos médicos de família dos Cuidados Primários do Norte de Portugal, representando 26,2% das unidades de saúde e 23 dos 24 Grupos de Centros de Cuidados Primários desta região. Os Estroprogestativos orais lideram a recomendação contraceptiva nos Cuidados de Saúde Primários do Norte de Portugal (84,4%; IC95%: 78,5% - 89,8%), seguidos pelos LARCs (21,6%; IC95%: 15,6% - 28,1%). O implante subcutâneo foi o LARC mais aconselhado (74,9%; IC95%: 68,3% - 80,8%) e colocado (70,7%; IC95%: 62,9% - 77,8%). A maioria não coloca contraceptivos intrauterinos (59,9%; IC95%: 52,1% - 67,1%), optando por referenciar as utentes para consulta de ginecologia. O implante subcutâneo tende a ser aconselhado a nulíparas ( $p < 0,001$ ) e a contraceção intrauterina a multiparas ( $p < 0,001$ ).

**Conclusões:** Existe uma mudança de paradigma na contraceção nos Cuidados de Saúde Primários do Norte de Portugal, com o aumento do uso de LARCs. Nesta região, o implante subcutâneo representa o LARC mais utilizado, opondo-se à tendência global em que a contraceção intrauterina é o LARC de escolha. Os LARC intrauterinos parecem ser mais dependentes de barreiras externas do que da competência dos médicos de família. Além de diminuir as referências hospitalares, a melhoria das condições de colocação dos LARC poderia otimizar a utilização da contraceção intrauterina e a saúde sexual dos utilizadores.

**Palavras-chave:** Dispositivos anticoncepcionais; Métodos de contraceção; Contraceção reversível de longa duração; Cuidados de Saúde Primários.

## INTRODUCTION

Contraception stands as one of the family planning pillars on preventing unwanted pregnancies, enabling couples to enjoy safer and more satisfying sexuality<sup>1</sup>. Although the use of oral contraceptives has been decreasing, it remains the contraceptive method of choice among Portuguese women<sup>1</sup>. About 20% of these women admit forgetting to take the pill every cycle or more than once a month, however, they do not report it to their physician<sup>1</sup>, attesting to the importance of long-acting methods. These methods tend to give the user more independence allowing them not to have the inconvenience of taking a daily pill<sup>1</sup>. On the other hand, a significant number of women present contraindications to estrogen use and/or do not tolerate its side effects, leading to poor compliance or discontinuation<sup>2</sup>.

The use of long-acting reversible contraceptive methods (LARCs) is gaining relevance in the current literature given their high efficacy, non-dependence on

use, high satisfaction and continuation rates<sup>1-3</sup>. According to the American College of Obstetricians and Gynecologists, LARCs are defined as contraceptive methods suitable for all women, including young and nulliparous women, with a periodic administration of more than 12 weeks that, together with sterilization, present 99% efficacy on preventing pregnancy<sup>4,5</sup>. The National Institute for Health and Care Excellence defines that all contraceptives with an administration of more than four weeks, including Progestogen-only injectable, are included in the LARCs group.

The present study was based on the American College of Obstetricians and Gynecologists classification and addressed subcutaneous (Implant) and intrauterine (IUC: intrauterine contraception) LARCs. In Portugal, four types of IUC are available: intrauterine systems (IUS) with 13.5 mg, 19.5 mg, 52 mg of levonorgestrel and the non-hormonal copper intrauterine device (IUD)<sup>2</sup>.

Although the technical procedures required for LARCs application integrate the Portuguese family physicians competencies, European studies reveal a scarce use<sup>5-7</sup>. The reluctance observed in the choice of LARCs, especially in intrauterine devices, falls on users and health professionals<sup>6-8</sup>. The need for a medical procedure and the professionals lack of experience, may

1. Mestrado, Faculty of Medicine, University of Porto, Porto, Portugal.

2. Doutoramento, Family Medicine Unit, Social Sciences and Health Department and , Centre for Research in Health Technologies and Information Systems (CINTESIS), Faculty of Medicine, University of Porto, Porto, Portugal; Family Health Unit Nova Via, Porto, Portugal.

explain the hesitancy on using these devices, leading to the adoption of other contraceptive methods and/or referral to a gynecology hospital appointment<sup>9</sup>. Greater accessibility to these methods and better education and training of family physicians would minimize the obstacles associated with their placement, especially the waiting time<sup>8</sup>.

There are currently no studies in Portugal describing either family physicians contraceptive practices or the use of LARCs and techniques associated with their use. Therefore, this study aims to characterize contraceptive practices and LARCs prescribing and placement in Northern Portuguese Primary Health Care.

## METHODS

A cross-sectional observational study was conducted using an online survey. A non-random, “snowball” sample of family physicians specialists and trainees from the Northern Regional Health Administration of Portugal was defined. All family physicians from this region were eligible. There were no exclusion criteria.

The questionnaire (Appendix I) was designed by the researchers based on previous studies<sup>10,11</sup>. A pre test of 10 interviews was carried out to assess language issues, comprehension of the questions, and time required for the application of the questionnaire. It was created in Google Forms®, disseminated via social networks and supported by health care institutions and professional organizations. The study was conducted between July 6th and November 1st, 2020.

The questionnaire included sociodemographic characteristics (gender, age, education, years of career), workplace characterization (Groups of Primary Care Centers, type of health unit, practice location defined as urban or rural by the participant, relative distance to the reference hospital), main contraceptive methods, counseling, clinical practice, views and opinions on the use of LARCs. The evaluation of contraception methods was based on three main key points: (1) which contraceptive methods are most used; (2) which are most associated with misuse and adverse effects; and (3) advice and clinical practice related to each type of LARC. In the analysis of clinical practice, we evaluate the degree of agreement of family physicians regarding

clinical situations in which the use of LARCs is generally indicated. The effectiveness, the frequency of counseling and the influence of parity on their choice was investigated. We analyze the different types of LARCs (Implant and IUC) separately and explored the family physicians formation, placement, removal, referral to hospital appointment, and the main reasons for not performing the respective procedures. Views and opinions about the use of LARCs were evaluated. The participants were questioned about placement in health care facilities, importance of training, access to necessary materials, willingness, institutional barriers, time, family physicians competence and need for ultrasound guidance.

This study was approved by the Ethics Committee of the São João Hospital Center/Faculty of Medicine of the University of Porto. No compensation was attributed to the participants. Informed consent was obtained from all participants at the beginning of the questionnaire, and the questionnaire only progressed after consent had been accepted.

Statistical analysis was performed using IBM SPSS® Statistics software, version 26 for Windows 10. Absolute and relative frequencies (n, %) were used to describe categorical variables. For quantitative variables with non-normal distribution, median and interquartile range (IQR) were used. Normality was assessed by observing histograms. The estimated prevalence of the population and the respective 95% confidence intervals were calculated. Likert Scale values were presented in horizontal bar charts, built in Tableau®, 2020.4 software, with three values: the neutral central value and the sum of the two extreme values. Pearson's Chi-square Test was used to evaluate the association between categorical variables. In the analyses, a  $p \leq 0.05$  level was considered significant.

## RESULTS

One hundred and seventy questionnaires were collected and three were discarded due to lack of data. A sample of 167 participants was analyzed, corresponding to 5.9% of the Northern Regional Health Administration family physicians<sup>12</sup>. This represented 26.2% of the health units (95 of the 363 health units)<sup>17-18</sup> and 23 of

the 24 Health Centre Grouping of Northern Regional Health Administration. Participants were mainly specialists, female, with ages ranging between 26 and 66 years (median 34 years). Most participants worked in model B family unit, in an urban environment, close to the reference hospital and had less than 10 years of professional experience. (Table I)

### Contraceptive methods in Primary Health Care

Family physicians had a median of 6.0 (IQR: 4) family planning appointments per week. There was a diversified use of contraceptive methods, with a clear predominance of Estroprogestative pills. LARCs proved to be a highly considered option, with the Implant as the most used (64.0%) followed by IUS (59.3%). The least used contraceptives were the Progestogen-only injectable and Transdermal estroprogestative. (Figure 1)

Most family physicians recognize that LARCs are not user dependent. Oral contraceptives were the method most frequently associated with misuse, with a predominance of Estroprogestative pills over Progestogen-only pills (73.6% vs 59.8%). (Figure 2.A)

Family physicians considered that the contraceptive methods available in Primary Health Care have little association with adverse effects. Progestogen-only injectable (37.7%), Implant (34.1%) and Estroprogestative pills (32.9%) were the most associated with adverse effects, while IUC and Vaginal contraception were the least associated with adverse effects. (Figure 2.B)

### Counseling and clinical practice regarding LARCs

The family physicians considered all LARCs a highly effective method. (Figure 3.A) The Implant was the most recommended LARC (74.8%). The frequency of LARCs counseling appears to decrease progressively with the decrease in the hormonal load of each device. Thus, lower hormonal load IUS and IUD are the least counseled. (Figure 3.B)

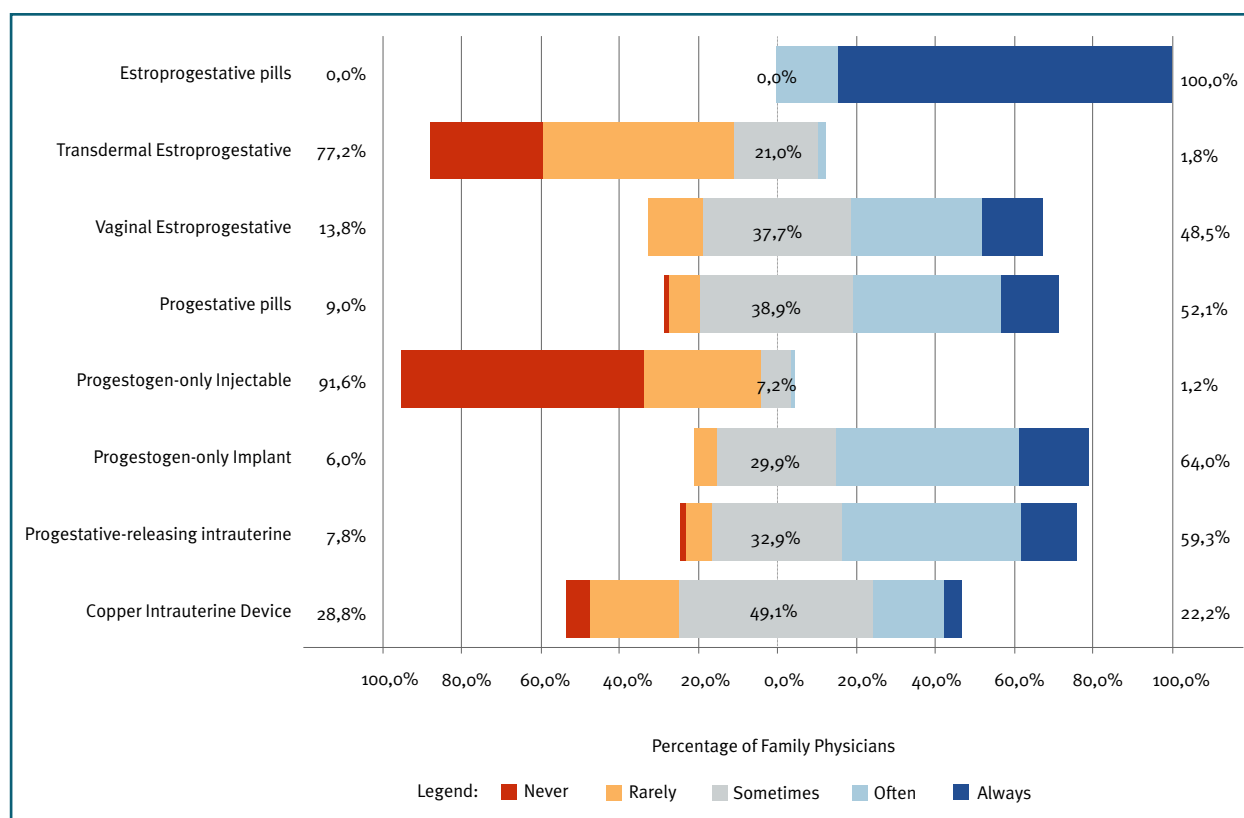
The most frequent indicators for LARCs use were estrogens contraindication (89.2%; 95%CI: 84.4% –

**TABLE I. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE.**

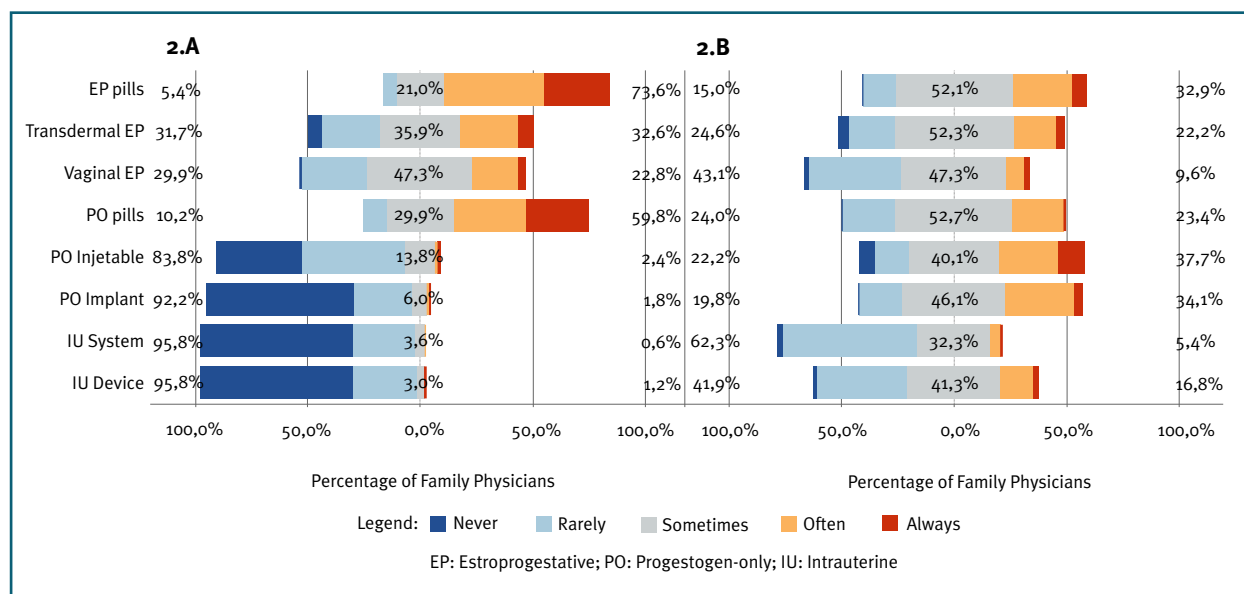
Sample characteristics	n	%
<b>Gender</b>		
Female	141	84,4
Male	26	15,6
<b>Age (years)</b>		
<30	51	30,5
[30-35]	41	24,6
[36-40]	33	19,8
≥ 40	42	25,1
<b>Education Level</b>		
Specialist	102	61,1
Trainee	65	38,9
<b>Years of professional experience</b>		
< 5	53	31,7
[5-9]	47	28,1
[10-14]	28	16,8
≥ 15	39	25,1
<b>Health unit type</b>		
Model A Family Unit	42	25,1
Model B Family Unit	104	62,3
Personalized Health Care Unit	21	12,6
<b>Workplace environment</b>		
Rural	55	32,9
Urban	112	67,1
<b>Perceived distance to the referral hospital</b>		
Near	149	89,2
Far	18	10,8

94.0%), patients request (83.8%; 95%CI: 78.4% – 89.2%), menorrhagia treatment (71.3%; 95%CI: 64.1% – 79.0%) and after voluntary interruption of pregnancy (60.5%; 95%CI: 53.3% – 68.3%). Five family physicians reported two additional clinical circumstances as a justification for LARCs preference: frequent forgetting to take oral contraceptives and the presence of a cognitive impairment/mental disability.

We found that LARCs recommendation was more dependent on the parity (51.5%; 95%CI: 43.1% – 59.3%) than on the age (32.9%; 95%CI: 25.7% – 40.7%). When asked about the use of LARCs according to parity, we concluded that family physicians tend to advise Implant for nulliparous ( $p < 0.001$ ) and IUC for multiparous women ( $p < 0.001$ ). Regarding multiparous women, higher hormonal load or copper



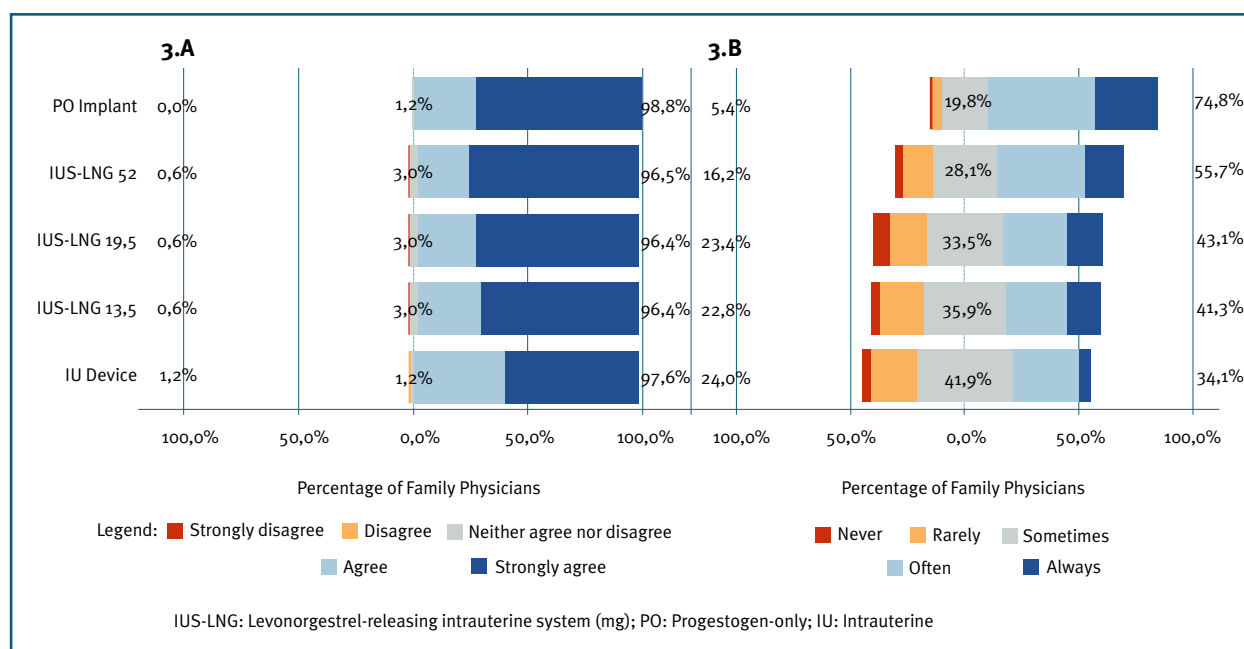
**FIGURE 1.** First-line contraceptive methods in primary health care.



**FIGURE 2.** Contraceptive methods associated with a higher rate of misuse (2.A) and more adverse effects and disadvantages for the user (2.B).

devices tend to be specially advised. A quarter of family physicians recommend using IUC to nulliparous wo-

men, preferring the IUS with lower hormonal load. (Table II)



**FIGURE 3.** Level of agreement with contraceptive effectiveness (3.A) and frequency of counseling of LARCs (3.B).

**TABLE II. SINDICATION OF LARCS ACCORDING TO THE PARITY OF THE USER.**

	Nulliparous		Valor $p^*$	Multiparous		Valor $p^*$
	n	%		n	%	
Progestogen-only Implant	114	68,3	< 0,001	7	4,2	< 0,001
IUS-LNG 13.5 mg	37	22,2		10	6,0	
IUS-LNG 19,5 mg	4	2,4		33	19,8	
IUS-LNG 52 mg	2	1,2		61	36,5	
Intrauterine Device	2	1,2		53	31,7	
I do not recommend	8	4,8		3	1,8	
Total	167	100		167	100	

Legend: IUS-LNG: Levonorgestrel-releasing intrauterine system (mg); \* Pearson's chi-squared,  $p \leq 0,005$

### Procedures associated with the use of LARCs

The LARCs placement was assessed in all Health Centre Grouping participating in the study.

At least one family physician in 46.3% of the health units placed both types of LARCs and in 17.9% none of the professionals placed any of them. The Implant was the most placed LARC, being the only placed LARC in 32.6% of the health units.

Most family physicians (70.7%, 95%CI: 62.9% – 77.8%) placed the Implant, with a median of 10 placements per year (IQR: 14), as well as removed it (78.4%,

95%CI: 71.9% – 84.4%), with a median of 7 removals per year (IQR: 5). We concluded that younger family physicians ( $p < 0.001$ ), with fewer years of professional experience ( $p < 0.001$ ), and trainees ( $p = 0.014$ ) were more apt on Implant placement. Factors such as gender or characteristics of the health care units (Groups of Primary Care Centres, type, environment, distance to the referral hospital) were not statistically significant for Implant placement or removal. (Table III)

Regarding IUC, we found that 40.1% (95%CI: 32.3% – 47.3%) of the family physicians placed the

**TABLE III. PLACEMENT OF LARCS AND RESPECTIVE SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE.**

	Progestogen-only Implant					Intrauterine contraception				
	Placement		Non-placement		<i>p</i> * value	Placement		Non-placement		<i>p</i> * value
	n	%	n	%		n	%	n	%	
<b>Total</b>	118	70,7	49	29,3		67	40,1	100	59,9	
<b>Gender</b>	0,218					0,263				
Female	97	58,1	44	26,3		54	32,3	87	52,1	
Male	21	12,6	5	3,0		13	7,8	13	7,8	
<b>Age (years)</b>	0,001					0,344				
< 30	41	24,6	10	6,0		18	10,8	33	19,8	
[30 - 35]	35	21,0	9	3,6		18	10,8	27	13,8	
[36 - 40]	22	13,2	8	6,6		17	10,2	12	9,6	
≥ 40	20	12,0	22	13,2		14	8,4	28	16,8	
<b>Education Level</b>	0,014					0,501				
Specialist	65	38,9	37	22,2		43	25,7	59	35,3	
Trainee	53	31,7	12	7,2		24	14,4	41	24,6	
<b>Years in career</b>	0,000					0,327				
< 5	43	25,7	10	6,0		18	10,8	35	21,0	
[5 - 9]	40	24,0	7	4,2		24	14,4	23	13,8	
[10 - 14]	16	9,6	14	7,2		10	6,0	18	10,8	
≥ 15	19	11,4	18	12,0		15	9,0	24	14,4	
<b>Health unit type</b>	0,495					0,448				
Model A FU	32	19,2	10	6,0		20	12,0	22	13,2	
Model B FU	73	43,7	31	18,6		38	22,8	66	39,5	
PHCU	13	7,8	8	4,8		9	5,4	12	7,2	
<b>Workplace environment</b>	0,135					0,186				
Rural	43	25,7	12	7,2		26	15,6	29	17,4	
Urban	75	44,9	37	22,2		41	24,6	71	42,5	
<b>Perceived distance to the referral hospital</b>	0,346					0,692				
Near	107	64,1	42	25,1		59	35,3	90	53,9	
Far	11	6,6	7	4,2		8	4,8	10	6,0	

Legend: FU: Family Unit; PHCU: Personalized Health Care Unit; \* *Pearson's chi-squared*,  $p \leq 0,005$ .

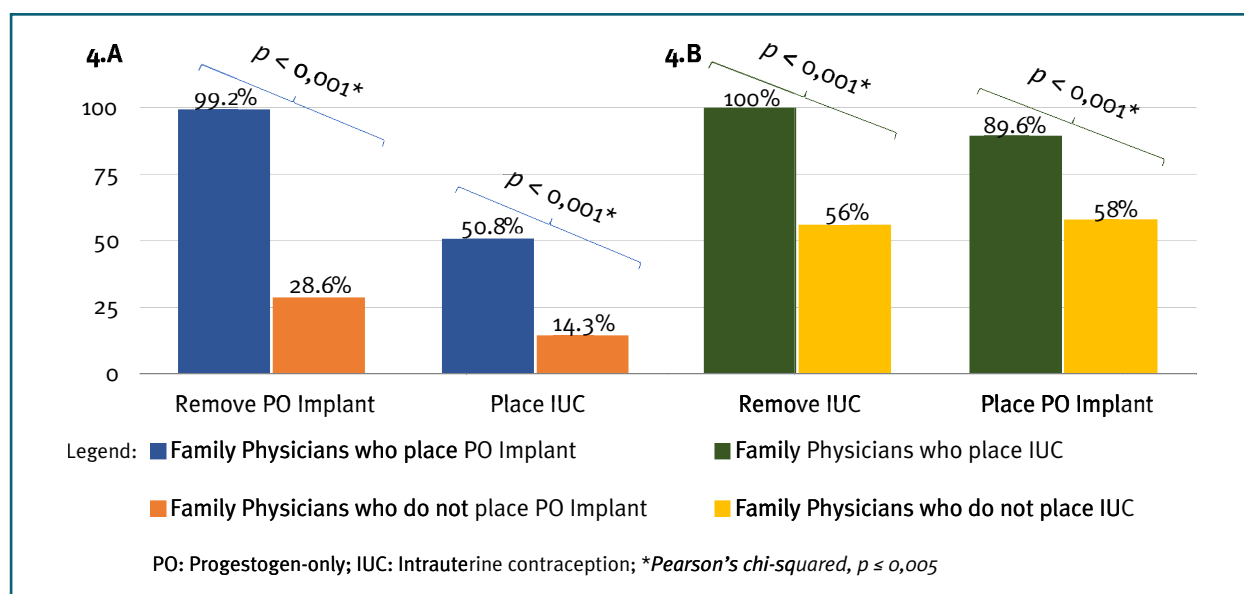
device, with a median of 9 insertions per year (IQR: 10). In contrast, 73.7% (95%CI: 67.1% – 80.2%) of family physicians removed these devices, with a median of 5 removals per year (IQR: 4). No sociodemographic factors were found to be associated with these procedures. (Table III)

About one third of the family physicians (35,9%; IC95%: 28,7% – 44,3%) placed both types of LARCS and one fourth (25.1%; 95%CI: 18.6% – 32.3%) placed neither. Family physicians who placed LARC also reported its removal ( $p < 0.001$ ). About half of the family

physicians who placed the Implant also placed the IUC ( $p < 0.001$ ). (Figure 4.A) Of those who inserted IUC, 89.6% also placed the Implant ( $p < 0.001$ ). (Figure 4.B)

The presence of a colleague in the health unit responsible for placing/removing the Implant was the main reason for not performing these procedures. The main reason for not perform IUC, was to refer the user to a gynecology appointment, followed for an uncomfortable position regarding the procedure and the fact that there are few colleagues with this competence in the health units. Placement of IUC justified almost





**FIGURE 4.** Relationship between the execution of subcutaneous Implant (4.A) and intrauterine contraception (4.B) placement procedures and the remaining LARCs procedures' performance.

**TABLE IV. MAIN REASONS FOR NOT PERFORMING THE TECHNIQUES REQUIRED FOR THE USE OF LARCS.**

	Progestogen-only Implant				Intrauterine contraception			
	Non placement		Non removal		Non placement		Non removal	
	n	%	n	%	n	%	n	%
There is a colleague in the unit responsible for placing these devices.	30	61,2	25	69,4	30	30,0	14	31,8
Do not feel comfortable performing the procedure.	7	14,3	5	13,9	46	46,0	23	52,4
Encourage the trainees to train the procedures.	7	14,3	5	13,9	9	9,0	1	2,3
Refer the user to a gynecology appointment.	15	30,6	7	19,4	59	59,0	26	59,1
<b>Total</b>	<b>49</b>	<b>100,0</b>	<b>36</b>	<b>100,0</b>	<b>100</b>	<b>100,0</b>	<b>44</b>	<b>100,0</b>

twice as many referrals to gynecology than Implant. (Table IV)

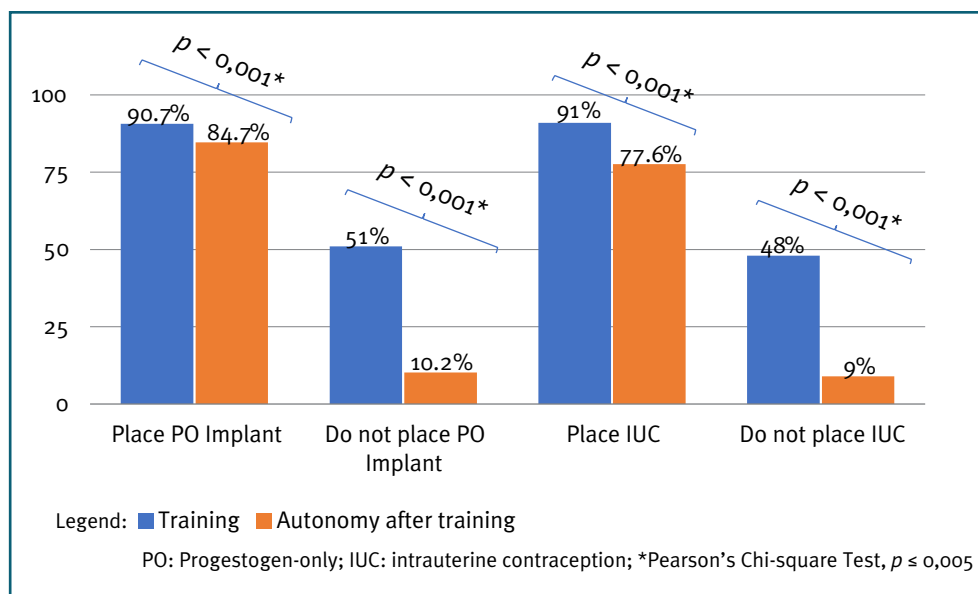
### Views and opinions

Procedures related to LARCs placement were significantly associated with the participants training and sense of autonomy. Most family physicians who placed LARCs were trained ( $p < 0.001$ ) and, thereby, felt able to perform the procedures autonomously ( $p < 0.001$ ). Among family physicians who did not place LARCs, about half were non-trained ( $p < 0.001$ ), and of those who were trained, only one-fifth felt able to perform the procedures autonomously ( $p < 0.001$ ). (Figure 5)

The importance of training family physicians was unanimous for placing both types of LARCs. The majority considered that the LARCs placement is a competence of family physicians. However, the number of physicians who excluded the placement of IUC from their competence was about three times higher than that observed for the Implant (12.0% vs 4.2%). Participants agree that the Implant should be placed in health units, but the opinion differs for the IUC (92.2% vs 65.2%). (Figure 6)

In general, family physicians felt more comfortable on the Implant placement (23.4% vs 53.2%) and showed less time to dedicate to IUC placement (48.8% vs 37.2%).





**FIGURE 5.** Association between LARCS placement with training and feeling of autonomy.

Access to materials needed for Implant placement appears to be easier when compared to IUC (82.0% vs 53.2%), with family physicians identifying more institutional barriers for IUCs placement (26.4% vs 11.4%). To mention that ultrasound-guided IUC insertion was considered necessary by 47.9% of the participants. (Figure 6)

The overall sample expressed interest in acquiring more skills in LARCs placement, more pronounced for IUC (77.2%, 95%CI: 70.7% – 83.2%) than for the Implant (67.1%, 95%CI: 59.9% – 74.3%).

## DISCUSSION

Estroprogestative pills, as in other countries, remain the first-line contraceptive method in the Northern Regional Health Administration of Portugal<sup>13-15</sup>, although the opinion of family physicians is that this method is associated with a higher rate of misuse, adverse effects and disadvantages for users.

The Implant is the second most used contraceptive method and the most recommended and placed LARC in northern region health units, opposing the worldwide tendency<sup>14-16</sup>. For example, compared to the United States, most family physicians from the Northern Regional Health Administration of Portugal place the

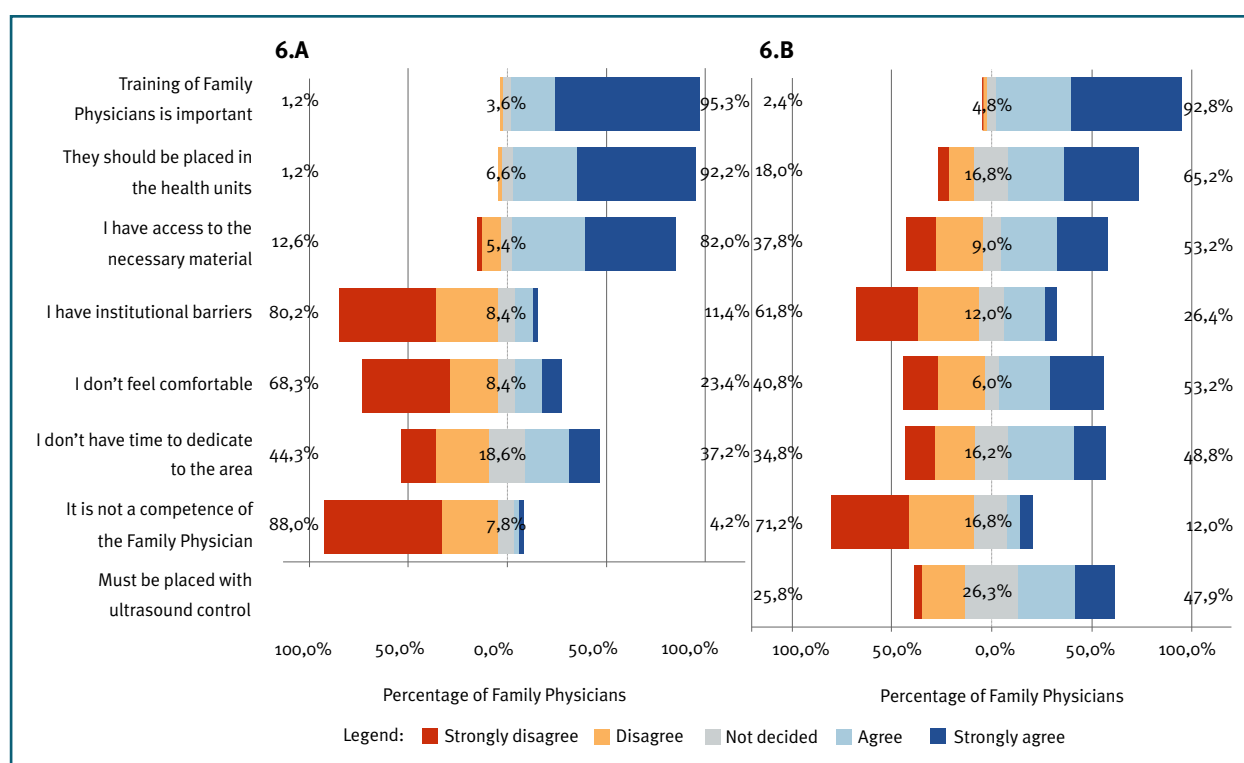
Implant (70.7% vs 11.3%) and feel comfortable with its insertion (68.3% vs 11.0%)<sup>11</sup>.

Regarding IUC, the authors consider a marked and transverse limitation of its placement in Primary Health Care. Still, the percentage of family physicians placing IUC in the northern region of Portugal is twice the reported in the United States (40.1% vs 19.7%). The comfort level experienced by the PFs when inserting the IUC is very similar in both countries (40.8% vs 42.0%)<sup>17</sup>.

Despite the very high contraceptive efficacy of the different LARCs<sup>4</sup>, the family physicians in the northern region of Portugal consider the implant to be more effective than IUC. In addition, these devices are more available in health care units and family physicians feel more comfortable placing them, which may motivate their increased recommendation and placement.

Of all LARCs available, the IUS with lower hormonal load is the least recommended. Besides being more recent, it is associated with a decreased lifetime of use and increased bleeding pattern than those with higher hormonal load<sup>18</sup>, then this could be the reason for your lesser advice.

A study by Água F *et al*, which assessed women's contraceptive practices in Portugal in 2015, compared the contraceptive method counseling between the family physicians and the gynecologists. Despite the different



**FIGURE 6.** Family physicians' level of agreement regarding subcutaneous implantation (6.A) and intrauterine contraception (6.B).

data collection methods, we inferred a significant increase in the LARCs advisement by family physicians in the northern region of Portugal (Implant: 27.3%<sup>1</sup> vs 64.0% and IUC: 42.9%<sup>1</sup> vs 81.5%) in the last 5 years, a trend also reported in Europe, Asia and developed countries<sup>16</sup>.

Family physicians from the north of Portugal recognize the clinical circumstances inherent to the preferential use of LARCs. However, its recommendation seems to depend on parity and, less extensively, on age. Most family physicians recommend IUC to multiparous and Implant to young nulliparous, limiting the recommendation of IUC to these women. This limitation appears to be based on several beliefs globally reported: the restricted indication for multiparous women, who do not intend to have more children and seek contraceptive efficacy equivalent to definitive contraception; the increased probability of ectopic pregnancy; the difficulty and/or complications associated with its insertion, such as pain, increased risk of pelvic inflammatory disease; the possibility of intrauterine perforation in adolescent and/or nulliparous women<sup>4,20,21</sup>. However, evidence shows that all

IUC are safe for all woman and associated with a low incidence of pain and complications upon insertion<sup>4,22,23</sup>. The difficulty of insertion seems to depend more on the education and training of physicians than on the parity of the women since it does not seem to be more difficult to insert in nulliparous women. Additionally, there are two types of IUC smaller in size and hormonal load and thus fully adapted to the uterine cavity of these women<sup>4</sup>. These results show that more training and evidence-based education is needed to dissipate these myths.

We recognize that Implant placement has become a transversal competence among family physicians from the north of Portugal (70.7%, 95%CI: 62.9% – 77.8% family physicians from the north of Portugal placed it). These devices tend to be significantly more placed by younger doctors, trainees and family physicians with less than 10 years of experience. Therefore, a future paradigm shift in the contraceptive practices of Portuguese family physicians is expected. Most family physicians consider that the Implant should be placed in the health units, where easy access to this method is guaranteed.

However, a significant fraction expressed a lack of time to dedicate to this area and the presence of a colleague in the health unit responsible for placing/removing the Implant was the main reason for not performing it.

We highlight the number of family physicians who distance the IUC insertion from the family physicians competencies. Our study found that the limited use of IUC is related to the uncomfortable position regarding this procedure, the lack of time to dedicate to this area, institutional barriers (such as inherent bureaucracy), lack of equipment and a “false need” for ultrasound control. Ultrasound-guided IUC insertion is reserved for insertion difficulties, obesity that limits bimanual examination or suspicion of uterine anomalies with cavity distortion<sup>4,24</sup>. Ultrasound control after insertion is optional and only indicated when the wires are not visible or in case of suspicion of uterine perforation<sup>4,24</sup>. Many family physicians are trained for IUC placement during their Gynecology and Obstetrics internship at the referral hospital. In addition to this training being often only observational, they view their placement primarily under ultrasound supervision. Consequently, most of these physicians choose to refer patients to a gynecology hospital appointment. We believe that this scenario may have a negative impact on health and wellbeing of Portuguese women by: (1) unnecessary increase in the number of gynecology appointments; (2) additional travel of the user; (3) delay at the beginning of contraception, which may negatively influence its adherence; (4) adoption of less effective contraceptive methods.

The fact that there are family physicians with the LARC insertion competence in all Health Centre Grouping who participated in the study, and in about half of the Northern region health units, the authors believe that Primary Health Care could respond to these users without the need for a hospital referral. The creation of specific medical appointments for the placement of LARCs would allow internal referrals as well as the training and experience acquisition centers for other physicians because we are of the opinion that all family physicians should have this competence.

This study shows that family physicians training is effective and a key element for the successful use and placement of LARCs and that there should be an investment in this area, especially when it comes to IUC. Regardless of the competence in the placement of

LARCs, family physicians demonstrate interest in acquiring more skills, representing valuable data for the consolidation of the change that this study highlights in the training of specialists in Family Medicine.

The paradigm shift in LARC placement in Northern Primary Health Care seems to be more dependent on external barriers than on the knowledge and competence of family physicians in the northern region. However, these data deserve further attention and investigation to objectify these barriers. Portuguese legislation provides that all LARCs are free of charge and must gather all the conditions to place them in Primary Health Care. Additionally, their use may only be refused on “duly justified medical grounds”<sup>25</sup>. The optimization of conditions in health facilities could improve not only the satisfaction of professionals but also the sexual health of users.

We found that in Northern Regional Health Administration of Portugal, LARC removal procedures are more performed than LARC placement procedures (78.4%, 95%CI: 71.9%-84.4% of family physicians remove the implant and 73.7%, 95%CI: 67.1% – 80.2% remove the IUC). We find these data interesting and merit an investigation in the future.

Our research portrays the contraceptive practices of family physicians from the north of Portugal and performs a psychometric analysis of the use of LARCs in this region. Given the absence of Portuguese studies in this area, this research remains a pioneer in the Portuguese health system. The limitations to this study include the low response rate. However, this potential bias was minimized by the good representativeness of the health units and Health Centre Grouping of Northern Regional Health Administration of Portugal. The “snowball sample” may cause a selection bias, as participants may have more interest or knowledge in contraception and/or use of LARCs. The current SARS-Cov-2 pandemic may have contributed to this low adherence and the decrease in the number of users of women of childbearing age, Family Planning appointments, and clinical practices evaluated in this study. Nevertheless, more studies concerning this new reality and its impact on Primary Health Care would be of great interest. A non-validated survey may have contributed to an information bias, despite having undergone a pre-test<sup>3</sup>.

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## AUTHOR'S CONTRIBUTIONS

MJR and LS contributed to the conception and design of the study and the survey, data collection and analysis, and writing the manuscript. LS contributed to the revising of the paper.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest.

## ENDEREÇO PARA CORRESPONDÊNCIA

Maria João Marques Reis  
E-mail: mjreis13@hotmail.com

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## APPENDIX I

### “Long-acting reversible contraceptive practices in Northern Portuguese Primary Health Care”

First, I would like to thank you for taking the time to participate in this study.

This study aims to determine the proportion of Family Physician (FP) who recommend and apply long-acting reversible contraception to their clients in Primary Health Care in the Northern Regional Health Administration. These contraceptive methods include the copper intrauterine device (IUD), the levonorgestrel intrauterine system (SIU) and the subcutaneous implant with etonogestrel.

Therefore, I invite you to complete an online questionnaire. It will take approximately 10 minutes to complete and is voluntary, and you may withdraw at any time.

This study is part of the master's thesis project being developed by Maria João Reis, a 5th-year student of the Integrated Master's Degree in Medicine at the Faculty of Medicine, University of Porto. It is under the supervision of Prof. Dr. Luísa de Sá, Invited Assistant Professor MEDCIDS, FMUP and Graduate Assistant of General Practice and Family Medicine at the Family Health Unit Nova Via.

This research has no funding or financial return. The investigators deny any conflict of interest.

The data collected will be used for scientific research purposes and will be kept for the period necessary for their processing and dissemination, which is expected to be approximately one year. Data security and protection is ensured through storage on password-protected equipment accessed only by researchers. The anonymity of responses guarantees confidentiality and data privacy. No electronic authentication is required.

This study was authorized by the Ethics Committee of the Faculty of Medicine University of Porto.

Participants have no immediate benefits, but data analysis may result in suggestions for improving contraceptive practices in Primary Health Care.

If you wish to receive the results of this study, please send us an e-mail.

Contact e-mail: mjreis13@hotmail.com

### SECTION I – CONSENT

1. After reading the introductory text, I consider myself informed and agree to participate in this study by answering this questionnaire.  
☐ Yes
2. I agree that this data will be used for research purposes.  
☐ Yes

**SECTION II – SOCIODEMOGRAPHIC DATA**

3. Gender
  - ☐ Female
  - ☐ Male
4. Age (years)
   
\_\_\_\_\_
5. Education level
  - ☐ Trainee in Family Medicine
  - ☐ Specialist in Family Medicine
6. Number of years of professional experience, including years in the residency?
   
\_\_\_\_\_
7. In which Group of Health Centre Grouping (HCG) of the Northern Regional Health Administration do you work?
  - ☐ HCG Alto Trás-os-Montes – Alto Tâmega e Barroso
  - ☐ HCG Alto Trás-os-Montes – Nordeste
  - ☐ HCG Alto Ave – Guimarães, Vizela e Terras de Basto
  - ☐ HCG Ave/Famalicão
  - ☐ HCG Cávado I – Braga
  - ☐ HCG Cávado II – Gerês/Cabreira
  - ☐ HCG Cávado III – Barcelos/Esposende
  - ☐ HCG Douro I – Marão e Douro Norte
  - ☐ HCG Douro II – Douro Sul
  - ☐ HCG Entre Douro e Vouga I – Feira e Arouca
  - ☐ HCG Entre Douro e Vouga II – Aveiro Norte
  - ☐ HCG Grande Porto I – Santo Tirso/Trofa
  - ☐ HCG Grande Porto II – Gondomar
  - ☐ HCG Grande Porto III – Maia/Valongo
  - ☐ HCG Grande Porto IV – Póvoa do Varzim/Vila do Conde
  - ☐ HCG Grande Porto V – Porto Ocidental
  - ☐ HCG Grande Porto VI – Porto Oriental
  - ☐ HCG Grande Porto VII – Gaia
  - ☐ HCG Grande Porto VIII – Espinho/Gaia
  - ☐ HCG Tâmega I – Baixo Tâmega
  - ☐ HCG Tâmega II – Vale do Sousa Sul
  - ☐ HCG Tâmega III – Vale do Sousa Norte
  - ☐ HCG Matosinhos
  - ☐ HCG Alto Minho

8. What is the type of health unit in which you work?
  - ☐ Model A Family Unit
  - ☐ Model B Family Unit
  - ☐ Personalized Health Care Unit
  
9. Name of the health unit where you work.  
 (This information will not be revealed in the results of the study. It will only be used to determine the number of different units in each GPCC that place and remove long-acting reversible contraceptive devices. Response not mandatory).  
 \_\_\_\_\_
  
10. Do you consider your workplace to be in a:
  - ☐ Rural environment
  - ☐ Urban environment
  
11. Do you consider your referral hospital with the specialty of Gynecology to be:
  - ☐ Nearby
  - ☐ Far away

### SECTION III – CONTRACEPTIVE METHODS IN PRIMARY HEALTH CARE

12. Before the COVID-19 Pandemic, how many Family Planning appointments did you make on average per week?  
 \_\_\_\_\_
  
13. Which first-line contraception method would you recommend for a healthy woman of childbearing age, excluding condoms and natural methods?  
 Choose the frequency level that best suits you by checking the appropriate circle. There are no right or wrong answers.

	Always	Often	Sometimes	Rarely	Never
Estroprogestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transdermal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Injectable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Implant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative-releasing intrauterine system (IUS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Copper Intrauterine Device (IUD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



14. Which method of contraception do you consider associated with a higher rate of misuse by the user, excluding condoms and natural methods?

Choose the level of frequency that best suits you, checking the respective circle. There are no right or wrong answers.

	Always	Often	Sometimes	Rarely	Never
Estroprogestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transdermal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Injectable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Implant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative-releasing intrauterine system (IUS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Copper Intrauterine Device (IUD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Which method of contraception do you consider to be associated with more adverse effects and disadvantages for the user?

Choose the level of frequency that best suits you by checking the appropriate circle. There are no right or wrong answers.

	Always	Often	Sometimes	Rarely	Never
Estroprogestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transdermal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal estroprogestative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative pills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Injectable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestogen-only Implant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progestative-releasing intrauterine system (IUS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Copper Intrauterine Device (IUD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### SECTION IV – ADVICE AND CLINICAL PRACTICE ABOUT LONG-ACTING REVERSIBLE CONTRACEPTION

16. “Long-acting reversible contraceptive methods are an effective method of contraception.”

Please mark the level of agreement that best indicates how you feel about the statement.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Progestogen-only Implant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 13,5 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 19,5 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 52 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. In your clinical practice, how often do you advise long-acting reversible contraception as a method of contraception?

Choose the level of frequency that best suits you by checking the appropriate circle. There are no right or wrong answers.

	Always	Often	Sometimes	Rarely	Never
Progestogen-only Implant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 13,5 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 19,5 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUS with 52 mg Levonorgestrel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IUD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Under what circumstances would you recommend the use of long-acting reversible contraception? You can choose more than one option.

- ☐ To all women of childbearing age, of any age, without contraindications for its use
- ☐ To all women of childbearing age, regardless of parity, with no contraindications for its use
- ☐ In women with contraindications for its use
- ☐ As emergency contraception
- ☐ After voluntary termination of pregnancy
- ☐ For the treatment of menorrhagia
- ☐ In patients with contraindications for the use of estrogens
- ☐ At the patient's request
- ☐ Not recommended
- ☐ Other: \_\_\_\_\_

19. What long-acting reversible contraception would you preferably advise for a healthy nulliparous young woman?

- ☐ IUS with 13.5 mg Levonorgestrel
- ☐ IUS with 19.5 mg Levonorgestrel
- ☐ IUS with 52 mg Levonorgestrel
- ☐ IUD
- ☐ Progestogen-only Implant
- ☐ Would not recommend – because \_\_\_\_\_

20. Which long-acting reversible contraception would you preferably recommend to a healthy multiparous woman who does not want to have more children?

- ☐ IUS with 13.5 mg Levonorgestrel
- ☐ IUS with 19 mg Levonorgestrel
- ☐ IUS with 52 mg levonorgestrel
- ☐ IUD
- ☐ Progestogen-only Implant
- ☐ I would not recommend – because \_\_\_\_\_

**SECTION V – PROGESTOGEN-ONLY IMPLANT**

21. Have you had training in the placement/removal of these devices?  
☐ Yes ----- Did you feel prepared to do it autonomously? \_\_\_\_\_  
☐ No
22. Do you place these devices for your clients?  
☐ Yes ----- On average, how many do you place per year? \_\_\_\_\_  
☐ No ----- Choose the one most appropriate:  
☐ There is a colleague in the unit responsible for placing these devices.  
☐ I do not feel comfortable performing the procedure.  
☐ I ask and encourage the specialty interns to practice placing them.  
☐ I refer the user to a Gynecology appointment.
23. How many women do you estimate have been referred to Gynecology for Progestogen only Implant insertion in the last twelve months?  
 \_\_\_\_\_
24. Do you remove these devices from your clients?  
☐ Yes ----- On average, how many do you remove per year? \_\_\_\_\_  
☐ No ----- Choose the one most appropriate:  
☐ There is a colleague in the unit responsible for placing these devices.  
☐ I do not feel comfortable performing the procedure.  
☐ I ask and encourage the specialty interns to practice removing them.  
☐ I refer the user to a Gynecology appointment.
25. How many women do you estimate have been referred to Gynecology for Progestogen only Implant removal in the past 12 months?  
 \_\_\_\_\_

**SECTION VI – IUD E IUS**

26. Have you had training in the placement/removal of these devices?  
☐ Yes ----- Did you feel prepared to do it autonomously? \_\_\_\_\_  
☐ No
27. Do you place these devices for your clients?  
☐ Yes ----- On average, how many do you place per year? \_\_\_\_\_  
☐ No ----- Choose the one most appropriate:  
☐ There is a colleague in the unit responsible for placing these devices.  
☐ I do not feel comfortable performing the procedure.  
☐ I ask and encourage the specialty interns to practice placing them.  
☐ I refer the user to a Gynecology consultation.

28. How many women do you estimate have been referred to Gynecology for IUD/IUS insertion in the last twelve months?

\_\_\_\_\_

29. Do you remove these devices from your clients?

- ☐ Yes ----- On average, how many do you remove per year? \_\_\_\_\_
- ☐ No ----- Choose the one most appropriate:
  - ☐ There is a colleague in the unit responsible for placing these devices.
  - ☐ I do not feel comfortable performing the procedure.
  - ☐ I ask and encourage the specialty interns to practice removing them.
  - ☐ I refer the user to a Gynecology appointment.

30. How many women do you estimate have been referred to Gynecology for IUD/IUS removal in the past 12 months?

\_\_\_\_\_

## SECTION VII – VIEWS AND OPINIONS

Please read each statement and mark the level of agreement that best indicates how you feel about each statement.

31. Regarding the SC Implant:

	Strongly agree	Agree	Not decided	Disagree	Strongly disagree
These devices should be placed in the health units themselves.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important that the FPs have basic training in this area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have access to all the necessary material for the placement and removal of these devices in my health unit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not feel comfortable placing/removing them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have institutional barriers for their placement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I do not have time to dedicate to this area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe this is not a competence of the FP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. Would you like to get more skills in this area?

- ☐ Yes
- ☐ No

## 33. Regarding IUD/IUS:

	Strongly agree	Agree	Not decided	Disagree	Strongly disagree
These devices should be placed in the health units themselves.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important that the FPs have basic training in this area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have access to all the necessary material for the placement and removal of these devices in my health unit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not feel comfortable placing/removing them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think they should be placed with ultrasound control.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have institutional barriers for their placement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I do not have time to dedicate to this area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe this is not a competence of the FP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 34. Would you like to get more skills in this area?

- ☐ Yes  
☐ No

**Thank you very much for your participation!**