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Perinatal contraceptive counselling: Effectiveness of a reinforcement intervention on top of standard clinical practice

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ABSTRACT

Objective: To assess the effectiveness of supplemental perinatal contraceptive counselling in addition to standard Spanish postpartum contraceptive counselling with regard to contraceptive use and use of effective contraception up to 1 year postpartum. Women's satisfaction with counselling and the method chosen was also assessed.

Design: Community-randomized trial.

Setting: "Reproductive and Sexual Health Care" units of the National Health Care System at twenty public Primary Care facilities in Catalonia (Spain).

Participants: 1,004 consecutive pregnant women (~week 30) receiving prenatal care between 1st October 2015 and 31st March 2016. Women were considered eligible for analysis if appropriate information was available.

Interventions: At half of the centres, midwives provided the standard Spanish postpartum contraceptive counselling (control group, CG). At the other half, supplemental perinatal contraceptive counselling was provided in addition to standard counselling (intervention group, IG) at different time points during pregnancy and postpartum. This consisted of a leaflet and a blog with practical information about all contraceptive options plus a short reminder message in the mobile phone during the third quarter of pregnancy and a face-to-face or a virtual meeting lasting 20 min in the first 15 days postpartum. Midwives used ad hoc questionnaires to collect information at week 30 of pregnancy (recruitment), and week 6, month 6 and month 12 postpartum.

Measurements and findings: 975 women were eligible for analysis (482 in the CG and 493 in the IG). ~33% women had resumed sexual intercourse by week 6, and nearly all by months 6 and 12. Use and effectiveness of contraceptives was similar in both groups at week 6 and month 6. At month 12, more women in the IG used more effective contraception and less women used contraceptives considered somewhat effective vs. those of the CG ($P = 0.006$). When considering the place of origin, this was only true for Spanish women. Women of other origins had a much higher use of very effective contraceptives at month 12 also in the CG, with contraceptive counselling having scarce effect. On multivariate analysis, conducted

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only in Spanish women, the additional counselling resulted in a higher use of highly effective methods while having a university degree increased 3.6 times the OR for this behaviour. A bias towards fostering use of very effective contraceptives among women with low education was seen in standard clinical practice. Satisfaction with counselling and the type of contraception chosen was higher in the IG.

Key conclusions: Our study has shown that the supplemental counselling tested has a moderate impact on contraceptive use and use of effective contraception in postpartum women. Results of this effort were seen after 6 months postpartum. A possible bias towards women who were more socially vulnerable was found in standard clinical practice, which reduced the effectiveness of the intervention in women who were otherwise the most needy.

Implications for practice: Despite the benefits provided by supplemental support in perinatal contraceptive counselling, the existence of a possible bias affecting the effectiveness of these interventions should be investigated and addressed.

Introduction

Short inter-pregnancy intervals are known to be associated with adverse outcomes such as preterm delivery, low birth weight and small for gestational age (Conde-Agudelo et al., 2006). This makes postpartum women a collective where family planning is of utmost importance (WHO, 2014b). The aim of postpartum family planning is to prevent unintended pregnancy and closely spaced pregnancies through the first 12 months following childbirth by helping women to decide on the contraceptive method they want to use, to initiate that method, and to continue to use the contraceptive for 2 years or longer, depending on the reproductive intentions of the woman or couple (WHO, 2014b, RCOG, 2015). Given its relevance, providing contraceptive counselling is nowadays considered a standard component of perinatal care (Lopez et al., 2012).

Some studies have shown that a significant number of women receive counselling on postpartum contraception, both prenatally (77–82%) and postpartum (68–87%) (Johnson et al., 2003; Yee and Simon, 2011; Glazer et al., 2011). However, although half of these interventions led to fewer unplanned pregnancies or more use of contraceptives, the overall quality of evidence supporting these interventions was moderate (Lopez et al., 2012). Subsequent studies have observed that women who receive family planning advice during prenatal care (Hernández et al., 2012; Zapata et al., 2015) or postpartum (Zapata et al., 2018) were more likely to use effective contraceptive methods after childbirth, with the greatest benefit observed in women with a low educational level (Hernández et al., 2012) and those receiving pre and postpartum counseling (Zapata et al., 2018). Some important aspects of perinatal contraceptive counselling require still further clarification, including determining when is the optimal time to provide it, and what method and content are the most effective to implement sustainable knowledge and pregnancy prevention behaviours (Cowman et al., 2013; Yee and Simon, 2011). There is also sparse information regarding women's perceptions of and preferences for postpartum contraceptive counselling (Yee and Simon, 2011). A recent systematic review has identified promising components of contraceptive counselling, which include shared decision-making, asking about the patient's reproductive life plan/pregnancy intentions, and a discussion on of contraceptive methods by level of effectiveness. The authors encourage strengthening the evidence supporting the effectiveness of these elements (Zapata et al., 2018).

The Spanish "Practical clinical guidelines of pregnancy and postpartum care" establish the need to provide contraceptive counselling as soon as possible following hospital discharge (i.e. in the postpartum visit 24–48 hrs after hospital discharge) and then at 6 weeks postpartum (MSCBS, 2014a). Considering that unless exclusively breastfeeding, women can become pregnant 21 days after childbirth if sexually active, efforts to avoid unintended pregnancies during the 6 weeks after giving birth rely on the first postpartum visit, when mothers are likely to have other priorities. On the other hand, contraception counselling at 6 weeks postpartum should tackle, in just a single visit, the choice of contraception that best suits the woman's medium or long-term fertility wishes according to her lifestyle and needs. The effectiveness of this contraceptive counselling has not been assessed but based on our clinical midwifery experience, there is still room for improvement. We have developed a supplemental perinatal contraceptive counselling intervention to be implemented prenatally and early in the postpartum period in addition to standard postpartum contraceptive counselling. In this study we assess the effectiveness of both counselling interventions (i.e., standard vs. standard + supplemental counselling) by examining contraceptive use and the use of effective contraception at 6 weeks, 6 months and 12 months postpartum. Women's satisfaction with this intervention was also assessed.

Methods

Community-randomized trial conducted among consecutive pregnant women (~week 30) receiving prenatal care at 20 "Reproductive and Sexual Health Care" (ASSIR, *Atención a la Salud Sexual y Reproductiva*) units at public Primary Care facilities of the National Health Care System in Catalonia, Spain. Women were recruited between 1st October 2015 and 31st March 2016. Inclusion criteria were being aged ≥18 years, having a mobile phone and access to the internet, and having signed an informed consent form. Exclusion criteria were: illiteracy, having a language barrier when no cultural-linguistic mediators were available, or not willing to use a contraceptive method after childbirth due to religious beliefs or sexual orientation. Recruitment was done by midwives caring for pregnant women at the participating centres. All information was centralized in a co-ordination centre.

Each ASSIR unit was allocated to one of two groups following a: the control group (CG), in which only standard contraceptive counselling was given, and the intervention group (IG), in which supplemental contraceptive counselling at different time points during pregnancy and postpartum was additionally provided. Each group consisted of 10 ASSIR units. This randomization ensured that the groups would be homogeneous and that there would be no sharing of information. The number of pregnant women to be recruited at each ASSIR was calculated on the basis of the number of first pregnancy visits that took place during 2014.

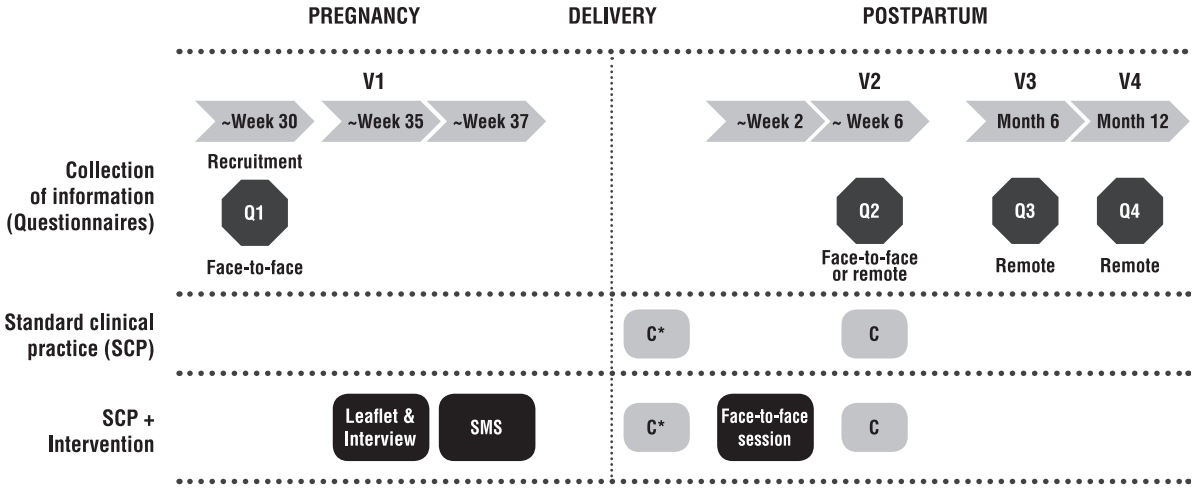

Fig. 1. C, contraceptive counselling
*24–48 hrs after discharge.

Interventions

As per standard Spanish clinical practice (MSCBS, 2014a), all women were provided with counselling by midwives about different contraceptive methods during the regular postpartum visits (24–48 hrs after hospital discharge and at 6 weeks postpartum) (Fig. 1). In addition to the counselling provided in standard clinical practice, women in the IG received the following extra counselling: i) at visit 1 (~week 35 of pregnancy), a leaflet providing practical information about all contraceptive options (effectiveness, safety, user dependence, spontaneity, safety while breastfeeding, protection against sexually transmitted diseases, relief of dysmenorrhoea, etc.) was given in person. This information was also made available on the ASSIR blog, which included a variety of issues about sexual health; ii) at week 37 of pregnancy, the women received a short message service (SMS) text reminder to consult the information about contraceptive methods provided in the blog, and iii) two weeks after delivery women participated in an individual 20-min long face-to-face session in which aspects of sexuality after childbirth and contraceptive options were discussed. During this session, the blog was used as a visual aid as well as to solve questions and overcome possible biases to certain methods (Fig. 1). Contraceptive counseling in the IG had an holistic approach, and included aspects such as the decision-making process according to women preferences, their reproductive desire and the involvement of the partner. In both cases, visits for placement were scheduled at the health care units where needed.

Data collection

Four questionnaires were completed by the midwives with the information provided by the women over the course of four interviews (Fig. 1): Questionnaire 1 at the recruitment visit (visit 1 at ~week 30 of pregnancy) and questionnaires 2, 3 and 4 during follow-up visits at 6 weeks (Visit 2) and at 6 and 12 months after childbirth (Visits 3 and 4). The first two interviews were conducted face-to-face except when this was impossible for some reason at visit 2; in this case, the opportunity to conduct a remote interview (by telephone or videoconference by Skype) was offered as an alternative. Interviews at visits 3 and 4 were remote. The latter could be conducted either by midwives or by an assistant. At each visit or call, women were reminded of the next visits.

Questionnaire 1 (Q1) collected socio-demographic information (age, place of origin, marital or civil partnership status, education level, employment status) and information about parity, abortions and whether the current pregnancy was planned or not. Some of these variables were already available in the Catalan electronic clinical record programme (ECAP, Estació Clínica d'Atenció Primaria). Questionnaire 2 (Q2) collected information about obstetrics (date of delivery, type of infant feeding), sexuality (resumption of sexual intercourse), and contraception (use of contraceptive methods, type of contraception). Questionnaire 3 (Q3) again collected information about the type of infant feeding, whether sexual intercourse had been resumed and whether a contraceptive method was used (and which one) (see Q2). The second part of this questionnaire also assessed the level of satisfaction with the information and counselling provided (What is your level of satisfaction with the contraceptive information and counselling provided?). The women allocated to the IG were also surveyed about their level of satisfaction with the usefulness of the information on methods of contraception provided a) in the printed or electronic materials and b) in the face-to face session: "How satisfied are you with the usefulness of a) the graphic and digital materials, ŕ b) the face-to-face session in helping you to choose the type of contraception that is best for you?". Questionnaire 4 (Q4) again gathered information about the type of infant feeding, whether sexual intercourse had been resumed and whether a contraceptive method was being used (and if so, what type) (see Q2). This questionnaire also surveyed both groups on their level of satisfaction with the type of contraception chosen. Data was collected using printed forms generated by TeleForm software and subsequently uploaded to a Microsoft Access file. Quality control was performed before the statistical analysis of the data collected.

Study implementation

Before implementation of the study, the research team presented the study to the participating midwives –and other health staff when considered relevant- at each ASSIR unit. The information was given to the participants for further consultations. The support material to be tested was delivered to the ASSIRs allocated to the experimental group. A training session was held to familiarize the health staff with the process of conducting interviews by telephone or Skype, including how to use the latter technology. A presentation on "Contraceptive methods and sexuality during postpartum" was provided to be used during the face-to-face session with the aim of making women aware of the danger associated to short inter-pregnancy intervals and the special character-

Table 1
Baseline women characteristics (week 30 pregnancy).

	Pregnancy CG ($N = 482$)	Visit 1 (~Week 30) IG ($N = 493$)	p
Age, mean (SD)	31.6 ± 5.2	31.4 ± 5.1	0.540
Place of origin, n (%)[a]			0.129
Spain	371 (77.1)	374 (76.0)	
Other European countries[§]	17 (3.5)	18 (3.7)	
Morocco	19 (4.0)	17 (3.5)	
Sub Saharan Africa	1 (0.2)	7 (1.4)	
Asia	11 (2.3)	4 (0.8)	
South America	62 (12.9)	72 (14.6)	
Education, n (%)[b]			0.063
Primary school or less	70 (14.7)	90 (18.6)	
High school	202 (42.4)	219 (45.3)	
University	204 (42.9)	174 (36.0)	
Paid work, n (%)[c]	346 (75.9)	332 (70.6)	0.072
Parity[#], n (%)[d]	188 (39.0)	187 (37.9)	0.731
Abortion, n (%)[e]	84 (17.6)	80 (16.4)	0.625
Planned pregnancy, n (%)[f]	408 (85.0)	402 (82.0)	0.214

Percentages are given for the valid population.
Missing values:
[a] 1 for GC and IG;
[b] 6 for GC and 10 for IG;
[c] 26 for CG and 23 for IG;
[d] non missings;
[e] 4 for GC and 5 for IG,
[f] 2 for GC and 3 for IG.
[#] Previous live birth.
[§] 77.1% of women were from Eastern Europe.

istics of this postpartum. A guide for conducting the face-to-face session was elaborated to ensure homogeneity of the supplementary counselling. A workshop was organized to explain this material to midwiferies. A case study was presented and discussed and ethic issues on contraception raised.

Outcomes

The effectiveness of the counselling intervention was assessed by measuring a) the use of contraceptives and b) the effectiveness of these contraceptives. Effectiveness of the intervention was assessed at 6 weeks, 6 months and 12 months postpartum. For this purpose, contraceptives were classified as "very effective", "effective" and "somewhat effective" according to the recent "Best Practices in contraceptive counselling" published in Spain (Costillas-Caño et al., 2018). Very effective methods included sterilization, long-acting reversible contraceptives (LARC) such as copper intrauterine devices (IUD), levonorgestrel intrauterine systems (IUS) and implants. Effective methods included injectables, contraceptive patches, pills and vaginal rings. Methods that were only somewhat effective included diaphragms, withdrawal, sponges, female and male condoms, fertility awareness-based methods and spermicidals. The use of lactational amenorrhea method (LAM) was not analyzed given the low number of women exclusively using this contraceptive method. Satisfaction with the contraceptive counselling intervention and the method chosen was assessed by means of a 5-level scale ranging from "very unsatisfied" to "very satisfied".

Statistical analysis

Women were considered eligible for analysis at each time point are shown in Fig. 2. At week 6, all women for whom Q1 was available were included. In order to optimize the number of women analyzed, in the subsequent visits women whose information about the use of contraceptives was available were included in the analysis, despite not having filled Q1. Information gathered in Q1 and Q2 was analyzed for the sample of women attending each visit, as these variables are likely to influence outcomes at each visit. Continuous variables are expressed as mean (standard deviation [SD]). Categorical variables were expressed as n (%). 95% interval confidence (95% IC) was calculated for measurements of contraception use. Pearson Chi Square test or linear trend test was performed for the analysis of qualitative variables while the Student t-test for the analysis of quantitative variables. Data about the use of different types of contraceptive methods at each time point is only descriptive, as the high quantity of contraceptives analyzed precluded the analysis of differences. At week 6 postpartum not all women have resumed sexual intercourse; therefore information about type of contraceptive methods used was only gathered among women having done so. Logistic regression models were used to identify independent risk factors associated to the use of no contraceptive method or contraceptive methods with low effectiveness at 12 months postpartum (visit 4). The selection of patients' characteristics was made on the basis of published data and own expertise. The initial logistic regression model included all variables that were individually associated with the dichotomous outcome "very effective /effective" vs. "somewhat effective" at a significance level of $P < 0.10$. The final model included variables that were statistically significant at the level of $P < 0.05$ as well as those with biological plausibility, with the counselling intervention being considered an independent variable. Odds ratios (OR) and 95% CI were calculated for each of the independent variables. Having received supplemental perinatal contraceptive counselling intervention (yes/no) was included as an independent variable. This analysis was conducted only in the Spanish population given the confusing effect of ethnicity, as revealed in this study. The model was not repeated on the different ethnic populations given the low number of women in each of them. All P-values were two-sided, with a P-value <0.05 being considered statistically significant. All statistical analyses were performed using SPSS v. 23.0.

Ethical aspects

The study was performed in compliance with the Declaration of Helsinki ethical principles. An independent Ethics Committee from the Fundación Jordi Gol approved the study protocol. The women were asked to update and sign the formal document ensuring that personal data is protected and allowing administrative or health information to be sent via SMS or e-mail. Precautions were taken to minimize all possible repercussions of the study on the women participating in it.

Results

Between 1st October 2015 and 31st March 2016, 1,004 women were recruited. After verifying the accuracy of the information collected, only 975 women who completed Q1 were considered eligible for analysis: 482 in the CG and 493 in the IG. In the IG, 428 (86.1%) women received all of the supplementary counselling (prenatal and postpartum); 4 women did not receive the leaflet and the SMS: 2 due to preterm birth and 2 due to change of residence; 61 women did not attend the face-to-face meeting that takes place 2 weeks postpartum. Fig. 2 shows the number of women attending each visit and those lost to follow-up (the study population). At visit 4, information from 72.1% ($n = 703$) of women was provided.

Socio- demographic, obstetric and sexual characteristics

The mean age of the women for whom Q1 was provided ($n = 975$) was 31.6 ± 5.2 in the CG and 31.4 ± 5.1 in the IG. Nearly all of the women had a partner (98.1% in the CG and 99.1% in the IG). The place of origin was Spain in 77% of cases. Less than 20%

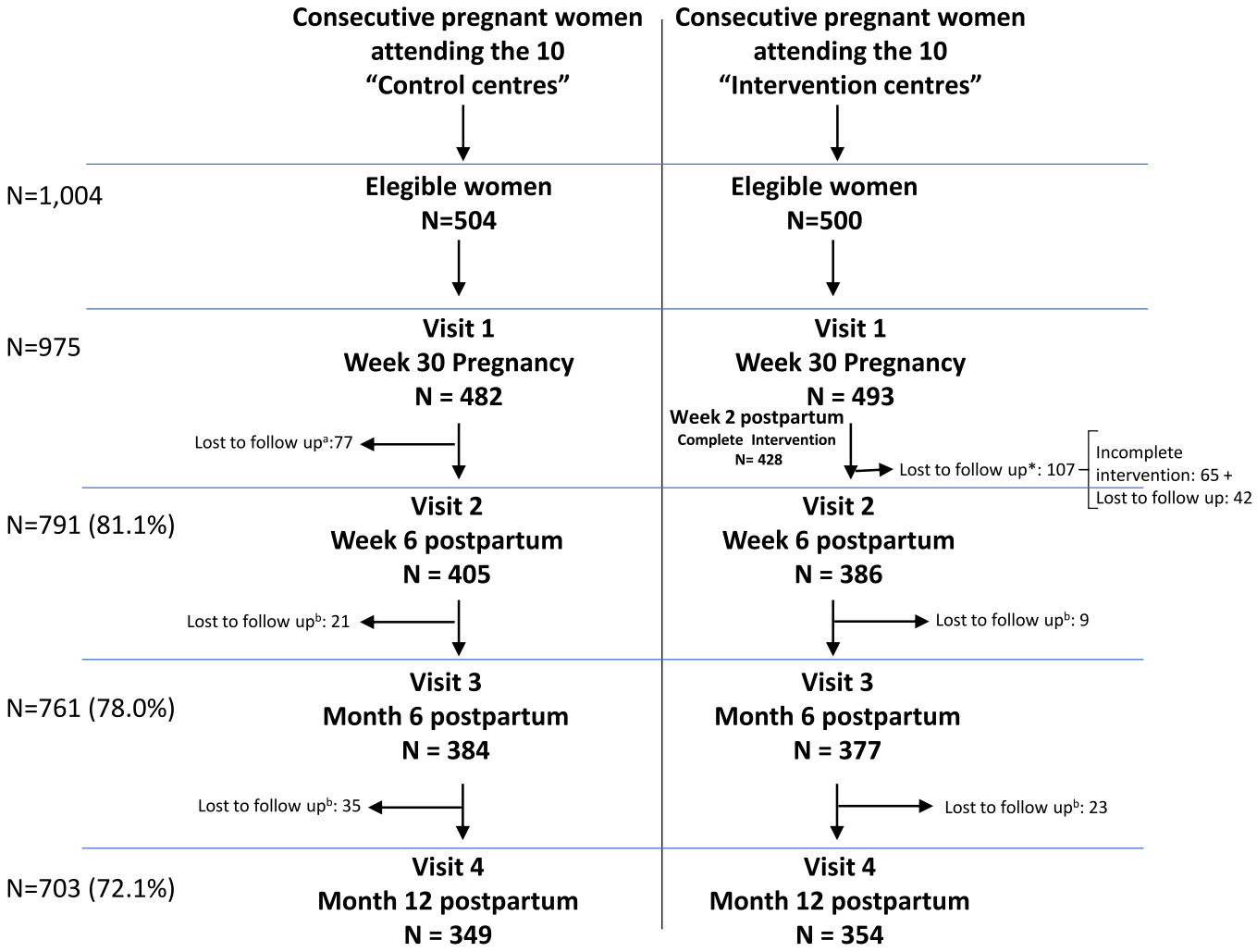

Fig. 2. [a]Lost to follow-up due to change of residence and/or healthcare center (private medical care).
[b] Lost to follow-up due to change of residence and/or not having answered the phone calls.
(*) 107 lost to follow-up:
42 Lost to follow-up due to change of residence and/or healthcare centre (private medical care).
65 lost to follow-up for not having properly received the supplementary counselling:
- 4 women did not receive the leaflet and the SMS: 2 due to preterm birth and 2 due to change of residence
- 61 women did not attend the face-to-face meeting taking place after 2 weeks postpartum.

of the women (14.7% in the CG and 18.6% in the IG) had a primary school education or less. In both groups, nearly three out of four (75.9% in the CG and 70.6% in the IG) were working. In the CG, 39% of the women had previous live births vs. 37.9% in the IG. In most cases the pregnancy was intended (>80%) in both groups. Nearly 17% in both groups had a previous abortion (Table 1).

Of the 493 women allocated to the IG, 385 (78%) attended the contraceptive counselling meeting scheduled at week 2 postpartum. In both groups, ~34% of women answering Q2 (n = 791) had already resumed sexual intercourse by week 6 postpartum (Table 2). This percentage increased to ~97% at month 6 and ~99% at month 12 in both groups. At week 6, the percentage of women who were exclusively breastfeeding was slightly higher (although differences were not significant) in the CG (74.7% vs. 67.0% in the IG), but afterwards decreased over time at a similar rate.

Effectiveness of the contraceptive methods used

The types of contraception used at week 6 (only women having resumed sexual intercourse; N = 141/405 [34.8%] at the CG and N = 128/386 [33.2%] at the IG) and months 6 and 12 by (overall population) are shown in Table 3. Despite differences between contraceptive methods could not be statistically analyzed, no differences were observed between CG and IG with respect to the effectiveness of contraceptives used at week 6 and at month 6 (P = 0.283 and P = 0.813, respectively). At month 12, more women in the IG used more effective contraceptives and fewer women used contraceptives that were only somewhat effective vs. those of the CG (P = 0.006). Among women in the IG group, a trend was also observed towards less non-use of contraceptives.

An analysis of the use of contraceptives and their effectiveness at month 12 according to place of origin revealed a difference in the contraceptive practices even in the CG: Women of other origins than Spain had a much higher use of very effective contraceptives even in the CG, with supplemental contraceptive counselling having effect. The supplemental contraceptive counselling intervention translated into a significantly lower non-use of contraceptives and use of more effective methods only in the Spanish population, probably due to the relatively small sizes of the populations of other origins (Table 4).

Among Spanish women, being aged ≥30 years, having a university degree and working was associated with a higher odds of non-

Table 2
Rsumption of sexual intercourse and type of feeding at week 6 postpartum. Evolution in the first year.

	Visit 2 (Week 6) (N = 791)		Visit 3 (Month 6) (N = 761)		Visit 4 (Month 12) (N = 703)	
Variable, n (%)	CG (N = 405)	IG (N = 386)	CG (N = 384)	IG (N = 377)	CG (N = 349)	IG (N = 355)
Resumption of sexual intercourse	141 (34.8%)	128 (33.2)%)	373 (97.1%)	368 (97.6)%)	347 (99.4%)	353 (99.7)%)
Infant feeding						
Breast	270 (74.6%)	229 (66.8%)	186 (49.2%)	162 (43.7%)	128 (37.3%)	102 (29.8%)
Mixed	37 (10.2%)	49 (14.3%)	64 (16.9%)	82 (22.1%)	42 (12.2%)	52 (15.2%)
Artificial	55 (15.2%)	65 (19.0%)	128 (33.9%)	127 (34.2%)	173 (50.4%)	188 (55.0%)

Differences between CG and IG were not significant in all cases.

Table 3
Type and effectiveness of contraceptive methods used at 6 weeks (only women having resumed sexual intercourse) and 6 and 12 months after delivery (overall population).

	Visit 2 (Week 6) (n = 791)		Visit 3 (Month 6) (n = 761)		Visit 4 (Month 12) (n = 703)	
Contraceptive method	CG (N = 141)	IG (N = 128)	CG (N = 384)	IG (N = 377)	CG (N = 349)	IG (N = 354)
No method	19 (13.5%)	11 (8.6%)	12 (3.1%)	9 (2.4%)	13 (3.7%)	3 (0.8%)
Low effectiveness	99 (70.2%)	95 (74.2%)	220 (57.6%)	210 (55.9%)	192 (55.2%)*	176 (49.7%)*
Withdrawal	10 (7.1%)	6 (4.7%)	10 (2.6%)	11 (2.9%)	14 (4.0%)	17 (4.8%)
Diaphragm	–	–	1 (0.3%)	–	1 (0.3%)	–
Spermicide	–	–	–	–	–	–
Male condom	89 (63.1%)	89 (69.5%)	206 (53.6%)	198 (52.5%)	175 (50.1%)	158 (44.5%)
Female condom	–	–	2 (0.5%)	1 (0.3%)	–	–
Fertility awareness	–	–	1 (0.3%)	–	2 (0.6%)	1 (0.3%)
Sponge	–	–	–	–	–	–
Good effectiveness	23 (16.3%)	20 (15.6%)	96 (25.1%)	104 (27.7%)	87 (25.0%)	92 (26.0%)
Injectable	–	–	2 (0.5%)	6 (1.6%)	2 (0.6%)	8 (2.3%)
Contraceptive patch	–	–	–	3 (0.8%)	–	2 (0.6%)
Progestin-only pill	18 (12.8%)	13 (10.2%)	66 (17.2%)	58 (15.4%)	42 (12.0%)	30 (8.5%)
Combined pill	2 (1.4%)	4 (3.1%)	24 (6.3%)	32 (8.5%)	35 (10.0%)	46 (13.0%)
Vaginal ring	1 (0.7%)	1 (0.8%)	4 (1.0%)	5 (1.3%)	8 (2.3%)	6 (1.7%)
LAM (up to 6 months)	2 (1.4%)	2 (1.6%)				
Very good effectiveness	–	2 (1.6%)	54 (14.1%)	53 (14.1%)	56 (16.1%)*	83 (23.4%)*
Male sterilization	–	–	–	–	5 (1.4%)	6 (1.7%)
Female sterilization	–	2 (1.6%)	3 (0.8%)	7 (1.9%)	3 (0.9%)	3 (0.9%)
IUD/IUS	–	–	38 (9.9%)	26 (6.9%)	37 (10.6%)	46 (13.0%)
Implant	–	–	13 (3.4%)	20 (5.3%)	11 (3.2%)	24 (6.8%)
Other						
LAM	–	–	2 (0.5%)	1 (0.3%)	1 (0.6%)	–

LAM, lactational amenorrhea method; IUD/IUS, intrauterine device/system;
Asterisks show main differences between CG and IC. Differences in the effeciveness of methods used at 12 months postpartum were statistically significant according to the Chi-square test (P = 0.006).

Table 4
Effectiveness of the contraceptive method used at month 12 and their effectiveness by place of origin.

N (%)	Spain[a] (N = 532)		Other European countries (N = 23)		Morocco (N = 23)		South America[b] (N = 94)	
	CG (N = 266)	IG (N = 266)	CG (N = 10)	IG (N = 13)	CG (N = 12)	IG (N = 11)	CG (N = 41)	IG (N = 53)
No method	11 (4.1%)	2 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	2 (4.9%)	0 (0.0%)
Low effectiveness	166 (62.4%)	143 (53.8%)	4 (40.0%)	2 (16.7%)	4 (18.2%)	4 (30.8%)	11 (26.8%)	21 (39.6%)
Good effectiveness	56 (21.1%)	64 (24.1%)	4 (40.0%)	6 (50.0%)	7 (63.6%)	4 (30.8%)	13 (31.7%)	13 (24.5%)
Very good effectiveness	33 (12.4%)	57 (21.4%)	2 (20.0%)	4 (33.3%)	2 (18.2%)	4 (30.8%)	15 (36.6%)	19 (35.8%)

P for linear trend:
[a] P = 0.020;
[b] P = 0.248Differences in women from Europe and Morocco could not be statistically analyzed given the reduced number of the populations.

use of contraceptives or the use of contraceptives that were only somewhat effective, while having planned the current pregnancy or having received the supplemental contraceptive counselling had a protective effect against this practice (Table 5a). On multivariate analysis, the supplemental support also had a protective effect (OR 0.66 [CI 95% 0.46–0.95], P = 0.025) while having a university degree increased the probability of using less effective contraceptive practices by more than three times (OR 3.59 [CI 95% 2.10–6.14], P<0.0001) (Table 5b).

The influence of education was further analyzed in order to understand these results. As shown in Table 6, in the Spanish population, the higher the educational level, the greater the effect of the intervention. Surprisingly, the lower the literacy level, the greater the use of effective or very effective contraceptives. This was true even in the CG.

Table 5
Factors associated with use of "good" and "very good" effective contraception methods at month 12 (Spanish population only; $N = 533$).

	Univariate analisys[a]			Multivariate analysis [b]		
	Coeficent	OR (CI 95%)	p	Coeficent	OR (CI95%)	p
Supplemental contraceptive counselling	0.507	1.66 (1.17–2,36)	0.005	0.417	1.52 (1.06–2.18)	0.025
Age ≥ 30 years old	−0.499	0.61 (0.41–0.89)	0.011			
Education*						
High school	−0.435	0.65 (0.38–1.09)	0.105	−0.433	0.65 (0.38–1.10)	0.108
University	−1.310	0.27 (0.16–0.46)	0.000	−1.279	0.28 (0.16–0.48)	0.000
Working	−0.745	0.48 (0.31- 0,74)	0.001			
Primiparous	−0.261	0.77 (0.54–1.10)	0.146			
Previous abortion	0.191	1.21 (0.72–2.05)	0.477			
Planned pregnancy	0.811	2.25 (1.32–3.84)	0.003			
Constant				0.084		

OR, odds ratio; CI, confidence interval
Outcome variable: "very good/good effectiveness" contraception method versus "Low effectiveness/NO method"
[a] Individual effect of variables included in the logistic regressions analyses model;
[b] Resulting logistic regressions model
* Reference: Primary school or less.

Table 6
Effectiveness of the contraceptive method used at month 12 by level of education (only Spanish population; $N = 533$).

N (%)	Primary school or less[a] ($N = 78$)		High school[b] ($N = 209$)		University[c] ($N = 238$)	
	CG ($N = 35$)	IG ($N = 43$)	CG ($N = 97$)	IG ($N = 112$)	CG ($N = 132$)	IG ($N = 106$)
No method	0	0	4 (4.1%)	0	7 (5.3%)	2 (1.9%)
Low effectiveness	15 (42.9%)	18 (41.9%)	54 (55.7%)	53 (47.3%)	95 (72.0%)	70 (66.0%)
Good effectiveness	11 (31.4%)	12 (27.9%)	23 (23.7%)	32 (28.6%)	22 (16.7%)	19 (17.9%)
Very good effectiveness	9 (25.7%)	13 (30.2%)	16 (16.5%)	27 (24.1%)	8 (6.1%)	15 (14.2%)

P for linear trend:
[a] $P = 0.771$;
[b] $P = 0.034$;
[c] $P = 0.003$

Satisfaction with the counselling intervention

This information was provided by 327/384 (85.2%) women in the CG and 356/377 (94.4%) women in the IG. Of these, 346 (97.2%) women in the IG were very satisfied or satisfied with the counselling received vs. 290 (88.7%) in the CG ($P < 0.0001$), with the difference being 48.6% vs. 59.0% for "very satisfied". Regarding the support materials provided in the IG, 90.5%, 68.8%, 72.6% and 93.3% of women were very satisfied or satisfied with the leaflet, the SMS text, the blog and the face-to-face session respectively, in reference to their usefulness in helping to choose a type of contraceptive. No relationship was found between satisfaction with the counselling intervention and the use of effective or very effective methods ($P = 0.472$).

Satisfaction with the contraceptive method chosen

This information was provided by 341/349 women in the CG and 351/354 women in the IG who answered Q4. Of these, 289 (82.4%) women in the IG vs. 256 (74.5%) women in the CG were very satisfied or satisfied with the contraceptive chosen ($P = 0.003$).

Discussion

Our study found that supplemental support in addition to standard Spanish contraceptive counselling practice was effective with regard to higher effectiveness of the contraceptives used at one year, which is likely to be the contraceptive used in the medium- or long-term, depending on fertility wishes. The effectiveness of the intervention could only be demonstrated in the Spanish population, probably due to the small size of the populations of other origins. Women with a university degree benefited most from the supplemental counselling. Most of the women who received this extra support were satisfied with the contraceptive counselling and with the contraceptive method chosen.

Among women having resumed sexual intercourse at week 6 after delivery, 86.5% in the CG and 91.4% in the IG used contraceptives. The special contraceptive counselling needs of women during the 6 weeks after childbirth and the effectiveness of the contraceptive methods used have been analyzed previously in a subgroup of women participating in this study (CG) (Reyes-Lacalle et al., 2018). The percentage of women not using "adequate contraceptive methods" (i.e. any method indicated during this period, excluding withdrawal) in this study was 20%. As highlighted in this study, the importance of the effectiveness of contraceptive methods used during this period may not be as relevant as the fact of using some form of contraception, given that some methods with high effectiveness are contraindicated during this period (WHO, 2016b). The percentage of women using no method or withdrawal was 20.6% in the CG (13.5% and 7.1%, respectively) and 13.3% in the IG (8.6% and 4.7%, respectively), which reflect at least a small effect of the supplemental contraceptive intervention.

The percentage of women using any form of contraception increased to ~97% in both groups at 6 months. It is worth noting that despite receiving contraceptive counselling, a similarly high percentage of women (58% in the CG and 56% in the IG) used contraceptive methods that are considered to have low effectiveness (Trussell, 2011). This is especially relevant as at this time, nearly all of the women were again sexually active and likely to be trying to avoid new pregnancies. This situation may mirror general contraceptive practices in Spain, where the male condom is the most common contraceptive method used among fertile women (mean of 28.4% by women aged 14–49 years) (SEC, 2016a), followed by pills (mean of 21.7%), both peaking in women aged 20–34 years. The use of very effective methods like IUD or IUS at this time

may be affected by the delay in getting a medical appointment for their insertion. On the other hand, gynaecologists may also be reluctant to offer these devices as a result of inadequate knowledge about eligibility and training (Cristobal et al., 2015). These aspects may have an influence on the low use of highly effective contraceptives in both groups, especially in the IG and may therefore explain why differences in the effectiveness of the contraceptives used were seen at one year after childbirth. At this time, the use of very effective methods was significantly higher in women having received the supplemental counselling (23.4% vs. 16.1% in the CG), while use of contraceptives with good effectiveness remained similar with respect to month 6 in both groups.

Since the use of different contraceptive methods may be greatly influenced by educational, social and religious beliefs, we explored the use of more effective methods at one year observed in the IG according to place of origin. As expected, the effectiveness of the intervention was evident only among native Spanish women ($P = 0.006$), where the use of very effective contraceptives was 21.4% in the IG and 12.4% in the CG. The intervention seemed to have also a positive effect in women from other European countries (up to 77% from Eastern Europe) and Morocco, although the small population size ($N = 23$ in both cases) precluded finding statistically significant differences. No differences in the use of more effective methods were found between the two groups in women from South America. Moreover, the use of contraceptives with low effectiveness was higher in the IG among these women and those from Morocco. Surprisingly, we noticed that the use of very effective contraceptives in the CG was three-fold higher among these women compared to Spaniards (35.6% vs. 12.4%). It was also higher among women from other European countries, although to a lesser extent (20%). Suspecting a bias towards women with low income or in a socially vulnerable position, we analysed the use of more effective methods in the CG and the effectiveness of the supplemental counselling according to educational level as a proxy for socio-economic status. This analysis revealed that, contrary to what was expected based on previous experiences (Hernandez et al., 2012), the use of very effective methods 1 year after childbirth was four-fold greater among women in the CG with a primary school education or less compared to their counterparts with a university degree (25.7% vs. 6.1%) and 1.5-fold greater compared to women with a high-school education (16.5%). Accordingly, the higher the educational level, the greater the effect of the supplemental counselling (17.5%, 46% and 232.8% more women with a primary school education or less, high school or university degree, respectively, used very effective contraceptive methods). This explains why on multivariate analysis having a university degree increased the likelihood of using more effective methods 1 year after childbirth. This bias towards greater use of very effective methods by socially vulnerable women is likely accomplished by fostering education and accessibility at the end of week 6 after childbirth, as during this period a low educational level is associated with a lower use of contraceptives and a higher use of those with low effectiveness (Reyes-Lacalle et al., 2018). The effect of other variables associated with a higher likelihood of using less effective methods, such as being aged <30 years or working, or with a lower likelihood of this practice (i.e. having planned the current pregnancy) disappeared on multivariate analysis.

Other aspects seen in this study include low use of the LAM (up to 1.6% at week 6 and up to 0.5% at month 6) although up to 75% and 49% were exclusively breastfeeding at week 6 and at month 6, respectively. This reflects the need for educating women on the protection offered by this method. Our study also revealed that although the level of satisfaction with standard counselling was high (89% of women were satisfied or very satisfied), it rose significantly with the supplemental counselling (up to 97%). Among the supporting materials or actions developed for this intervention, the leaflet provided prenatally and the face-to-face session were scored the best (90% and 93% of women in the IG were satisfied or very satisfied with the supplemental counselling, respectively). Satisfaction with the method chosen was also high in the CG (74%), also increasing significantly after the supplemental counselling. We did not assess the satisfaction with this additional counselling based on place of origin or level of education, which could have reflected the bias seen in the use of effective contraceptives. Conversely to the study conducted by Dehlendorf et al. (2016), we did not observe a relationship between the degree of satisfaction with supplementary counselling and higher use of effective or very effective contraceptives.

Some limitations have to be acknowledged. These results have to be interpreted taking into account the special socio-demographic characteristics of the Spanish population, as compared to that of other studies, and within these, those of the participants of this study, conducted in an specific geographic area of Spain (Catalonia), with some of the participant centres having a large percentage of foreign population from low-income countries. One characteristic of postpartum care in Spain is that it is covered by the National Health Care System, which provides universal health coverage for all. Additionally, social work centres facilitate financial coverage of methods not covered by the public health system, as in the case of IUD/IUS. This may explain the higher use of contraceptives with high effectiveness in women from low-income countries or with a low level of education. It is also worth noting that pregnancy wishes were not collected in our study; however, should any of these women have intended a new pregnancy in the short term, this would have been reflected in higher non-use of contraceptives at one year, which was not the case. Fertility wishes may have affected pregnancy outcomes during the follow-up which taken together with the short period covered, makes this outcome irrelevant for the purpose of the study. Finally, only 87% of women in the IG attended the face-to-face interview at week 2 postpartum, and 78% attended the last regular postpartum follow-up visit that took place 6 weeks after delivery (Visit 2). Effectiveness of the supplementary intervention in women lost to follow-up between those events is unknown. Comparison with other experiences is difficult due to these socio-demographic and health-care access characteristics and the contraceptive practices noted above, but also because other studies focus on contraceptive counselling provision vs. no intervention and not on supplemental counselling for pre-existing counselling. Some factors which have shown to be associated to non-use of contraceptives in the postpartum period analysed, such as not being married, having had stress before or during pregnancy, non-use of contraceptives before pregnancy or having a low family income (Hernandez et al., 2012), were not included in our study and therefore their effect remains unknown. Similarly, intimate partner violence, which is known to adversely affect the use of contraceptive methods following delivery (Cha et al., 2015), was not analyzed. All these aspects warrant further consideration by family planning programmes. Our study has the strength of being prospective and, to our knowledge, being the first to report contraceptive behaviours throughout the first year postpartum.

Conclusion

Our study has shown that the supplemental counselling provided in our study in addition to standard Spanish practice had a moderate impact on contraceptive use and use of effective contraception in postpartum women. Results of this effort were seen after 6 months postpartum. A possible bias towards women who were more socially vulnerable was found in standard clinical practice, which reduced the effectiveness of the intervention in women who were otherwise the most needy. These observations should be

considered when implementing counselling programmes in clinical practice.

Ethical approval

Not applicable.

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Declaration of Competing Interest

None declared.

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