Women's attitudes towards mechanisms of action of birth control methods: a cross-sectional study in five European countries

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ABSTRACT

Aims and Objectives: To assess women's attitudes towards the mechanisms of action of birth control methods.

Background: When addressing women's knowledge of and attitudes towards birth control methods, researchers frequently focus on side effects, effectiveness or correct use. Women's opinions about mechanisms of action have been much less investigated and research is usually concentrated on the EC pill.

Design: Cross-sectional study.

Methods: Women, aged 18-49, from Germany, France, the UK, Sweden and Romania were randomly selected (N=1137). They were asked if they would use a method that may work after fertilization or after implantation and if they would continue using it after learning it may have such effects. Logistic regression was performed to evaluate the influence of certain characteristics on women's attitudes.

Results: Almost half of women in Romania and Germany would not use methods with postfertilization effects, while the lowest percentages were found in Sweden and in France. Regarding methods with postimplantation effects, higher percentages were found in all the countries. Highly educated women and those using a highly effective method were more likely to use methods with postfertilization effects. On the contrary, married women, those who stated that human life begins at fertilization and women with middle/high religiosity were less likely to consider using methods that may act after fertilization.

Conclusions: One third of European women reported that they would not consider using a method that may have postfertilization effects.

Relevance to clinical practice: Given that postfertilization effects may not be acceptable to some women, informing them of which methods may have these effects is essential to obtaining complete informed consent and to promoting women's autonomy.

Key words: informed consent, family planning, postfertilization effects, mechanism of action, emergency contraceptive pill, intrauterine device, oral contraceptives.

INTRODUCTION

Informed consent is a commonly recognized ethical requirement in medical practice. It ensures patient autonomy and encourages the patient to take an active role in her/his health care. Some authors define it as a “process through which an individual arrives at a decision based upon access to, and full understanding of all necessary information from his/her perspective”. In this context, the term informed choice is used (Upadhyay 2001).

With respect to family planning (FP), the Cairo International Conference on Population and Development stated “the right of men and women to be informed about and to have access to safe, effective, affordable and acceptable methods of family planning of their choice” (United Nations 1994). Informed choice regarding FP methods is associated with greater effectiveness and satisfaction with the method (Backman *et al.* 2002, Canto De Cetina *et al.* 2001, Levy *et al.* 2010, Nobili *et al.* 2007).

To assure that a given choice about FP methods is truly informed, women need to know about all the characteristics, factors, and issues that could influence their decisions. For example, according to a study conducted in the USA, some European countries and Australia, some women would use a highly effective method even if it caused menstrual disturbances, while others would switch to another method because of that side effect (Hooper 2010). How each method works to avoid pregnancy also influences women's choices. FP methods can act before fertilization, after fertilization but before implantation (postfertilization effects) or after implantation (postimplantation effects), depending on the method. Barrier methods, fertility awareness based methods and sterilization work before fertilization. Hormonal contraceptives, including the emergency contraception (EC) pill, and the intrauterine device act mainly before fertilization, but they can also have postfertilization effects. None of them can disrupt an implanted embryo (Frye 2006, Larimore & Stanford 2000, Lopez-del Burgo *et al.* 2011, Stanford 2008, The ESHRE Capri Workshop Group 2008). The mifepristone, also known as “RU-486” or

“medical abortion”, acts after implantation (DeHart & Morehead 2001). Postfertilization and postimplantation effects could interfere with the development of an embryo, which is a source of concern for some women. In a study among Latino women in Texas (USA), those who believed that the EC pill worked mainly by preventing ovulation were significantly more willing to take it compared to those who believed that it prevented implantation (Romo *et al.* 2004). Another study indicated that 45% of a representative sample of Spanish women would not use a FP method with postfertilization effects (Lopez-del Burgo *et al.* 2010). A higher figure (53%) was found among women from Utah and Oklahoma (USA) (Dye *et al.* 2005).

When addressing women's knowledge of and attitudes towards FP methods, researchers frequently focus on side effects, effectiveness or correct use (Sundby *et al.* 1999). Women's opinions about mechanisms of action have been much less investigated and research is usually concentrated on the EC pill (Campbell *et al.* 2008, Gould *et al.* 2002, Jackson *et al.* 2000).

The aim of our study was to assess women's attitudes towards the mechanisms of action of birth control methods in several European countries. We explored whether women would consider: (1) using a method that may work after fertilization, (2) using a method that may work after implantation, (3) continuing to use a method after learning it may work after fertilization and (4) continuing to use a method after learning it may work after implantation. We also investigated which personal characteristics were associated with these opinions. According to previous findings in Spain about this topic (Lopez-del Burgo *et al.* 2010), we hypothesized that around 45% of European women would not consider using a method that may exhibit postfertilization effects.

METHODS

Study population

We conducted a cross-sectional study in Germany, France, the UK, Sweden and Romania, which have different socio-cultural profiles and patterns of birth control use. Details of this study

have been published elsewhere (De Irala *et al.* 2011). Spain was not included because previous research about the same topic was conducted there (Lopez-del Burgo *et al.* 2010).

Participants were women aged 18-49. Contraceptive use was not required for inclusion. Pregnant women or those trying to get pregnant, as well as sterile women were excluded, as their current motivations about family planning are different from potentially fertile women. Women with a sterilized male partner were not excluded as they could have sexual relationships with a different man.

The sample size required for each country was calculated assuming that 45% of women would not consider using a method with postfertilization effects, as found in the Spanish study (Lopez-del Burgo *et al.* 2010). We estimated a sample size of 264 per country, taking into account a 95% confidence interval and a precision of $\pm 6\%$.

The Institutional Review Board of the University of Navarra approved the study.

Questionnaire

A 31-item questionnaire designed to capture the knowledge, beliefs and attitudes of women about mechanisms of action of FP methods was created, details of which have been published elsewhere (Dye *et al.* 2005, Lopez-del Burgo *et al.* 2010). Briefly, the questionnaire included a picture of the female reproductive system and an explanation of the early stages of human reproduction, from fertilization to implantation. "Stage 1" referred to the period before fertilization, "stage 2" to the period between fertilization and implantation and "stage 3" encompassed the period after the implantation of the embryo in the uterus. The medical definition of a pregnancy was not provided in the questionnaire. Women were then asked if they would consider using a method which may act after fertilization (but before implantation) or after implantation, and if they would continue or stop using a method after learning it may have such effects. We did not ask if women would consider using a specific contraceptive method, such as oral contraceptives or intrauterine devices. Demographics, reproductive history and use of any

birth control method (current or past) were also asked. There were no questions about sexual behaviour. Important findings from this questionnaire not included in this article (i.e. knowledge and beliefs about mechanisms of action of specific birth control methods) have been published elsewhere (De Irala *et al.* 2011, Lopez-del Burgo *et al.* 2012).

Native speakers, from an experienced international market research company (GFK-Emer), made translations of the questionnaire from English into local languages. They used back-translation to check the accuracy of the local versions. They also checked if questions were intelligible and had all the possible responses. The questionnaire is available from the authors upon request.

Sampling and data collection

The sampling and the data collection was performed by the market research company. Age specific recruitment quotas were determined according to each country's official statistics in order to obtain nationally representative samples. After stratifying populations by geographic location and residential size, a computer program randomly chose census sections and routes. The researchers invited women from households to participate in the study. In Sweden and the UK, women from an internet panel set by the research market company, were randomly selected and invited to participate in the study via internet. If a woman refused to enter into the study, another one with similar eligibility criteria was randomly selected, until the targeted study size was reached.

Data collection started in October and finished in December 2008. A letter requesting voluntary, anonymous participation was provided to women before they filled out the questionnaire. Computer-Assisted Personal Interviewing method was used in France, Germany and Romania, while Web-based interviews were conducted in Sweden and the UK. Participants were not incentivised in any way.

Analysis

The statistical software SPSS version 15.0 (IBM, Chicago, IL, USA) was used to analyse the data. Proportions and their 95% confidence intervals were estimated. Logistic regression analyses were used to evaluate the independent influence of various characteristics on the women's attitudes about mechanisms of action of FP methods, specifically whether they would consider using a method that may work after fertilization or after implantation, and if they would continue using a method after learning it may work after fertilization or implantation.

The independent variables were age, parity, desire for future pregnancy, previous elective abortion, education (low, medium versus university), marital status (married vs. unmarried), opinion about when human life begins (at fertilization, implantation, after implantation, no exact time, do not know), current use of a highly effective method and religiosity. According to contraceptive guidelines, hormonal contraceptives and IUD are the most effective methods, together with sterilization (Hatcher *et al.* 2008). "Medium, high religiosity" corresponded to women who identify with a religion, attend church more than once a month and consider faith to be an important influence in their life. Women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life were classified as "low religiosity".

We also explored the consistency of women's responses. For example, if a woman would not use a method with postfertilization effects, she probably would not use a method with postimplantation effects. We performed analyses both using the global sample and excluding women with inconsistent responses.

RESULTS

Characteristics of the sample

There were 1137 women in the study. We selected approximately 200 participants per country because of budgetary constraints, obtaining a precision of $\pm 6.9\%$. Their characteristics

are shown by country in Table 1. The highest proportion of university graduates and unmarried women was found in the Swedish sample (45.8% and 72.9%) and the lowest in the Romanian (19.8% and 26%). The highest percentage of nulliparous women was found in the French sample (66.8%), which also registered the highest percentage with respect to the desire to get pregnant in the future (60.5%). The majority of the overall sample had a low religiosity. Approximately, one third of the women surveyed believed that human life begins at fertilization (Table 1).

Use of a highly effective FP method was very common among German and French women (65%) but relatively low among Romanians (26.9%) (Table 1). Patterns of contraceptive use among countries have been described elsewhere [ref. omitted]. The most popular FP methods in the five countries were oral contraceptives (OCs) (36.3%), condoms (24.1%) and intrauterine devices (IUDs) (10.9%).

Nine per cent of questionnaires had inconsistencies regarding intent to use a method that may act after fertilization or implantation. We repeated all the analyses excluding these questionnaires and obtained essentially the same results. Therefore, we decided to present results from the entire sample to assure representativeness.

Opinions and attitudes related to mechanisms of action of birth control methods

When asked whether they would consider using a method which may work after fertilization, 30.6% of the women in the overall sample responded "no". When asked whether they would consider using a method that may work after implantation, this percentage increased to 47.8%. The highest percentages of women reporting that they would not accept the use of methods with postfertilization effects were found in the Romanian and German samples, while the lowest in the Swedish and French samples (Table 2).

One quarter of the women stated they would stop using their current method if they were informed that it may work after fertilization, and 44.3% reported that they would cease using it if informed that it may work after implantation. While 17.1% of women in Germany were unsure

about their decision, the percentage of unsure women increased to 40.5% in Romania (Table 2). One third of the women responded that it was important to distinguish, from their moral/ethical point of view, between spontaneous and induced embryonic losses (Table 2).

Using logistic regression, we assessed which of the characteristics shown in Table 1 were independently associated with willingness to use a method that may work after fertilization or after implantation. The results are shown in Table 3.

Educational level, religiosity, and beliefs about when human life begins were the three variables significantly associated with the women's opinions about the mechanism of action of FP methods. Highly educated women were more likely to consider using methods with some postfertilization or postimplantation effects. Women using a highly effective method were also more likely to consider using a method that may work after fertilization, but not after implantation. Conversely, women with medium/high religiosity as well as those who consider that human life begins at fertilization were less likely to use or continue using methods with postfertilization or postimplantation effects. Married women were also less likely to consider using a method that may work after fertilization or after implantation (Table 3).

DISCUSSION

This study indicates that 31% of European women would not consider using a FP method that may have postfertilization effects, and that 48% would not consider using methods that may have postimplantation effects. Our results confirm previous findings from Spain and the USA. In the Spanish study, 45% of women reported that they would not use a method with post fertilization effects; a full 57% said they would not use a method with postimplantation effects (Lopez-del Burgo *et al.* 2010). The study conducted in Utah and Oklahoma (USA) showed even higher percentages (53% for methods acting after fertilization and 74%, for methods acting after implantation) (Dye *et al.* 2005).

Dehlendorf et al in a study among women of reproductive age in California found that women desire more autonomy in their decisions about FP than in other health-related matters (Dehlendorf *et al.* 2010). In addition, those who highly valued autonomous decision-making reported higher satisfaction with the chosen method. Complete informed consent includes information not only about a FP method's effectiveness, adverse effects, or possible contraindications, but its mechanism of action as well. It could be argued that since the postfertilization effects of several methods cannot be confirmed beyond doubt, (Leung *et al.* 2010, The ESHRE Capri Workshop Group 2008) the issue could be excluded from contraceptive counselling. But the postfertilization effects of several methods cannot be completely ruled out either (Frye 2006, Lopez-del Burgo *et al.* 2011, Stanford & Mikolajczyk 2002). They could therefore be problematic for some women. In our study, beliefs about when human life begins, religiosity and education were associated with attitudes about this issue, but other characteristics might be found associated in other populations. As it would be difficult to identify which women could have concerns about postfertilization effects, full disclosure to all women about these effects seems essential to assuring proper informed consent. In this context, Larimore and Stanford proposed an approach to the discussion of possible postfertilization effects into the clinical encounter (Larimore & Stanford 2000). They suggest that FP provider might say: *"Most of the time, the pill acts by preventing an egg from forming. However, women on the pill can still sometimes get pregnant. Some doctors think that the pill may cause the loss of some of these pregnancies very early in the pregnancy, before you would even know you were pregnant. Would knowing more about this possibility be important to you in your decision about whether to use the pill?"* (Larimore & Stanford 2000, p.131).

We consider that this is a valid approach. The client is the one making decisions about whether specific pieces of information are important to him/her or not. A more condescending approach of informed consent in which the provider decides which information is of importance

probably seems inadequate. We are not aware of published studies exploring what or how FP providers tell women about the mechanisms of action of birth control methods.

As expected, religious women and those who believe that life begins at fertilization were less likely to consider using methods with possible postfertilization effects. It is noteworthy that the number of women with high/medium religiosity in our study was very low, except in Romania. While beliefs about the beginning of human life are often associated to religious beliefs, this association is not always consistent. In fact, 30.3% of women with no religion or low religiosity in our study also believed that human life begins at fertilization, in accordance with scientific data (Condic 2008, Pearson 2002). Among women with high religiosity, 57% believed so, whereas 10% believed it begins at implantation, 17.5% after implantation, and 15.5% did not know (data not shown).

Several studies have demonstrated that personal beliefs about when human life begins could shape attitudes towards FP methods, which our analyses confirmed. Results from two family medicine clinics in the USA showed that 20% of the female patients would use the EC pill only if it acted before fertilization (Campbell *et al.* 2008). In another study conducted among men and women in Mexico, those who responded that human life begins at fertilization were more likely to believe that the EC pill was an abortifacient instead of a contraceptive method because it could prevent the implantation of an embryo (Gould *et al.* 2002).

Women using a highly effective method when surveyed were more likely to consider using methods with postfertilization effects. We did not evaluate the relative importance of mechanisms of action compared to other characteristics of birth control methods. It would not be surprising if some women prioritized effectiveness over mechanism of action, since effectiveness tends to be the most important factor in choosing a FP method (Grady *et al.* 1999, Steiner *et al.* 2003). Future research might shed light on how women weigh the various properties of FP methods, including mechanism of action, in making a final decision.

Limitations

Our study has limitations. Although country samples were intended to be representative, generalizations of the results need to be made with caution. The country sample sizes could have been higher to better assure representativeness. Although non-participation was not recorded, replacement was performed using pre-established criteria to ensure representativeness. But a selection bias could have happened. One could argue that women with concerns about postfertilization effects would be more likely to participate in the study. But the contrary is also possible: those with concerns could refuse to participate because this is a sensitive topic. Therefore, we think that the possible bias could have had a minimum or null effect on the results. Besides this, characteristics found in our samples were consistent with those found in other nationally representative surveys. For example, the percentages of people identifying themselves as non-religious are high in the U.K. (50%), France (46%) and Sweden (41%) (DeHart & Morehead 2001), as we found in our own samples. Marital status and educational levels in our samples were also similar to other accepted European data indicating that marriage is relatively more common in Romania (National Institute of Statistics of Romania 2010), while Sweden typically has the lowest percentage of married women among the studied countries (Statistics Sweden 2010). The proportion of university graduates in our samples were very similar to those identified by the Organization for Economic Cooperation and Development (OECD) (Organization for Economic Cooperation and Development 2009). Also, in our study, 32% of the entire sample stated that human life begins at fertilization while 15.3% stated that it begins at implantation. These data are consistent with those from the *Study on perceptions of and attitudes towards Biotechnology*, conducted in 9 European countries. In that study, the percentage of participants who stated that human life begins at fertilization ranged from 26% in Holland to 52% in Italy and Poland (BBVA Foundation 2003). Finally, the patterns of birth control methods

found in our sample are consistent with other European studies about contraceptive practices (Cibula 2008, Skouby 2004).

Uncertainty with respect to how well the participants understood questionnaire may represent another limitation of this study. Some of them may not have fully understood the stages of human reproduction or the mechanisms of action of FP methods. However, we found apparently inconsistent responses in only 9% of the overall sample. An example of inconsistency was a woman who would not use a method with postfertilization effects and stated that she would use one with postimplantation effects. We repeated the analyses excluding these respondents and obtained practically the same results. Although apparent inconsistencies were not frequent, approximately 25% of the sample responded "unsure" as to whether they would consider using of a method with postfertilization effects. Figures were higher when asked about the decision of continuing using a method after learning it may have postfertilization effects. The questionnaire does not allow us to differentiate whether this uncertainty was due to a limited understanding of the issues, or whether it was simply uncertainty about attitudes. Although the question was accompanied by a graphical depiction of human reproduction, general lack of knowledge regarding human reproduction could have limited how well respondents understood the information provided. On the other hand, it is possible and even likely that many women were undecided about whether a FP method's postfertilization effects would pose ethical problems for them.

Besides these limitations, our study also has several strengths. This study was conducted in representative samples of five European countries. The same questionnaire was implemented and self-administered in the five countries, thus comparisons among countries were possible. In the questionnaire, we did not specify when human life begins nor explain what were the mechanisms of action of any particular birth control method, in order to not influence in women's

responses. In addition, we also avoided the terms “abortion” or “abortive”, using less value-laden terms such as embryo loss or postfertilization/postimplantation effects.

CONCLUSION

Approximately one third of women from five European countries reported that they would not consider using a FP method that may have postfertilization effects. Educational level, religiosity, and personal beliefs about when human life begins were associated with this attitude. As postfertilization effects may not be acceptable to some women, full disclosure about methods that may act in this way is essential to obtaining completely informed consent.

RELEVANCE TO CLINICAL PRACTICE

Hormonal contraceptives and intrauterine devices work mainly avoiding fertilization, but they may sometimes impair the implantation of an early embryo. Postfertilization effects of these birth control methods may not be acceptable to some women, especially to those who consider that human life begins at fertilization. Therefore, communicating which methods may have these effects is essential to obtaining complete informed consent and to promoting women's autonomy in family planning.

AUTHOR DISCLOSURE STATEMENT

The authors declare that they have no conflicts of interests.

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AUTHOR CONTRIBUTIONS

CLB, RTM and JI participated in the design and coordination of the study, supervised the statistical analysis and helped to draft the manuscript. CLB and AO performed the statistical analysis. TE helped to draft the manuscript. All authors contributed to the final manuscript.

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Table 1. Study Participant Characteristics

Characteristics	GERMANY (N=199) %	FRANCE (N=202) %	U. KINGDON (N=203) %	ROMANIA (n=227) %	SWEDEN (N=306) %	TOTAL (n=1137) %
Age						
18-29	32.7	52.5	28.1	41.4	53.6	42.7
30-39	32.2	26.2	40.4	36.6	22.9	31.0
40-49	35.2	21.3	31.5	22.0	23.5	26.3
Education						
Low, medium	75.4	66.8	69.0	80.2	54.2	68.0
High (college, university)	24.6	33.2	31.0	19.8	45.8	32.0
Marital status						
Unmarried	50.3	57.4	52.2	26.0	72.9	52.0
Married	49.7	42.6	47.8	74.0	27.1	48.0
Parity (No. births)						
0	38.2	66.8	29.6	30.8	56.9	40.9
1+	61.8	33.2	70.4	69.2	43.1	59.1
Desire for future pregnancy	28.8	60.5	30.0	28.6	50.9	40.7
Previous induced abortion*	3.0	15.8	10.8	19.4	15.7	13.4
Current use of a highly effective method[†]	64.3	65.3	43.3	26.9	59.8	52.1
Religiosity[‡]						
Low, no religion	92.0	95.5	93.6	67.8	97.1	89.4
Medium, high	8.0	4.5	6.4	32.2	2.9	10.6
Opinion about when human life begins						
Fertilization	39.2	33.2	37.4	34.4	20.9	31.9
Implantation	21.6	12.9	18.2	14.5	11.4	15.3
Other [§]	39.2	53.9	44.3	51.1	67.7	52.8

*Self-reported data

[†] Highly effective methods: hormonal contraceptives (oral, patch, vaginal ring, injectable and implant) and IUD (inert, copper and hormonal)[‡] Low, no religion: women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life. Medium, high: women who identify with a religion, attend church more than 1/month and consider faith to be an important influence in their life.[§] Other: "after implantation", "there is no exact time", "I do not know"

Table 2. Women's opinions and attitudes towards mechanisms of action of birth control methods.

Opinion or Attitude	GERMANY (n=199) % (95% CI)	FRANCE (n=202) % (95% CI)	U. KINGDON (n=203) % (95% CI)	ROMANIA (n=227) % (95% CI)	SWEDEN (n=306) % (95% CI)	TOTAL (N=1137) % (95% CI)
Would consider using a method that may work after fertilization?						
Yes	30.2 (23.9-37.0)	50.0 (42.9-57.1)	45.3 (38.3-52.4)	18.9 (14.1-24.7)	55.9 (50.1-61.5)	41.1 (38.2-44.0)
No	47.2 (40.1-54.4)	22.8 (17.2-29.2)	24.6 (18.9-31.2)	47.1 (40.5-53.9)	16.7 (12.7-21.3)	30.6 (27.9-33.4)
Unsure/Did not answer	22.6 (13.4-24.7)	27.2 (21.2-33.9)	30.1 (23.8-36.9)	33.9 (27.8-40.5)	27.4 (22.5-32.8)	28.3 (25.7-31.0)
Would consider using a method that may work after implantation?						
Yes	14.1 (9.6-19.7)	31.7 (25.3-38.6)	23.2 (17.5-29.6)	10.6 (6.9-15.3)	32.7 (27.5-38.2)	23.1 (20.7-25.7)
No	63.3 (56.2-70.0)	41.1 (34.2-48.2)	48.3 (41.2-55.4)	54.6 (47.9-61.2)	36.9 (31.5-42.6)	47.8 (44.9-50.8)
Unsure/ Did not answer	22.6 (17.0-29.1)	27.2 (21.2-33.9)	28.6 (22.5-35.3)	34.8 (28.6-41.4)	30.4 (25.3-35.9)	29.1 (26.4-31.8)
Decision after learning a method may work after fertilization						
Continue using	19.1 (13.9-25.3)	34.7 (28.1-41.7)	31.0 (24.7-37.9)	8.8 (5.5-13.3)	40.2 (34.7-45.9)	27.6 (25.0-30.3)
Stop using	41.2 (34.3-48.4)	24.8 (18.9-31.3)	19.7 (14.5-25.9)	29.5 (23.7-35.9)	16.3 (12.4-21.0)	25.4 (22.9-28.1)
Depends how often it works like that	18.6 (13.4-24.7)	14.9 (10.3-20.5)	18.7 (13.6-24.8)	10.1 (6.5-14.8)	10.8 (7.5-14.8)	14.2 (12.2-16.3)
Unsure/ Did not answer	21.1 (15.7-27.4)	25.7 (19.9-32.3)	30.5 (24.3-37.4)	51.5 (44.8-58.2)	32.7 (27.5-38.3)	32.8 (30.1-35.6)
Decision after learning a method may work after implantation						
Continue using	9.0 (5.5-13.9)	18.8 (13.7-24.9)	16.3 (11.5-22.1)	5.7 (3.1-9.6)	22.2 (17.7-27.3)	15.0 (12.9-17.2)
Stop using	60.3 (53.1-67.2)	47.0 (40.0-54.2)	40.4 (33.6-47.5)	39.6 (33.2-46.3)	38.2 (32.8-43.9)	44.3 (41.4-47.3)
Depends how often it works like that	11.1 (7.1-16.3)	14.4 (9.8-20.0)	16.7 (11.9-22.6)	5.7 (3.1-9.6)	9.2 (6.2-13.0)	11.1 (9.3-13.1)
Unsure/ Did not answer	19.6 (14.3-25.8)	19.8 (14.5-26.0)	26.6 (20.7-33.2)	48.9 (42.2-55.6)	30.4 (25.3-35.9)	29.6 (27.0-32.4)
Cause of embryonic loss *						
Not important	36.7 (30.0-43.8)	45.5 (38.5-52.7)	39.4 (32.6-46.5)	18.1 (13.3-23.7)	44.4 (38.8-50.2)	37.1 (34.3-40.0)
Important	42.2 (35.3-49.4)	32.7 (26.3-39.6)	30.5 (24.3-37.4)	33.0 (27.0-39.6)	30.1 (25.0-35.5)	33.3 (30.6-36.2)
Unsure/ Did not answer	21.1 (15.7-27.4)	21.7 (16.3-28.1)	30.1 (23.8-36.9)	48.9 (43.1-56.5)	25.5 (20.7-30.8)	29.6 (26.9-32.3)

95% CI: 95% confidence interval of the proportion

* Cause of embryonic loss: refers to whether it is important to distinguish spontaneous embryo losses from those that may be caused by birth control methods.

Table 3. Variables associated with women's opinions about mechanisms of action of birth control methods.

Variables	Would you consider using a method that may work after...?				What would you do after learning a method may work after...?			
	Fertilization		Implantation		Fertilization		Implantation	
	% Yes	OR ^a (95%CI)	% Yes	OR ^a (95%CI)	% Continue using	OR ^a (95%CI)	% Continue using	OR ^a (95%CI)
Education								
Low, medium	35.9 (263/732)	1	20.5 (150/732)	1	23.6 (173/732)	1	13.1 (96/732)	1
High*	48.7 (167/343)	1.73 (1.31-2.28)	27.1 (93/343)	1.41 (1.03-1.92)	34.1 (117/343)	1.75 (1.30-2.35)	17.8 (61/343)	1.48 (1.03-2.13)
Marital status								
Unmarried	44.7 (250/559)	1	26.3 (147/559)	1	29.3 (164/559)	N.S.	16.5 (92/559)	N.S.
Married	34.9 (180/516)	0.73 (0.56-0.95)	18.6 (96/516)	0.70 (0.52-0.94)	24.4 (126/516)		12.6 (65/516)	
Religiosity[†]								
Low, no religion	42.7 (409/957)	1	24.3(233/957)	1	29.3 (280/957)	1	15.7 (150/957)	1
Medium, high	17.8 (21/118)	0.37 (0.23-0.62)	8.5 (10/118)	0.35 (0.18-0.68)	8.5 (10/118)	0.27 (0.14-0.54)	5.9 (7/118)	0.40 (0.18-0.89)
Opinion about when human life begins								
Fertilization	23.7 (83/350)	0.31 (0.23-0.42)	15.1 (53/350)	0.43 (0.31-0.61)	14.0 (49/350)	0.28 (0.20-0.40)	6.3 (22/350)	0.24 (0.15-0.39)
Implantation	40.6 (67/165)	0.67 (0.47-0.97)	13.3 (22/165)	0.36 (0.22-0.58)	20.0 (33/165)	0.42 (0.27-0.64)	6.7 (11/165)	0.25 (0.13-0.48)
Other [‡]	50.0 (280/560)	1	30.0 (166/560)	1	37.1 (208/560)	1	22.1 (124/560)	1
Current use of a highly effective method[§]								
No	34.7 (180/518)	1	21.6 (112/518)	N.S.	22.4 (116/518)	1	13.1 (68/518)	N.S.
Yes	44.9 (250/557)	1.48 (1.14-1.92)	23.5 (131/557)		31.2 (174/557)	1.50 (1.13-2.00)	16.0 (89/557)	

^a Odds ratio adjusted for the variables shown in the table and for age, parity, previous elective abortion and desire of future pregnancy. Only statistically significant variables are displayed. N.S: not statistically significant

*High: college, university degree

[†] Low, no religion: women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life. Medium, high: women who identify with a religion, attend church more than 1/month and consider faith to be an important influence in their life.

[‡]Other: "after implantation", "there is no exact time", "I do not know"

[§]Highly effective methods: hormonal contraceptives (oral, patch, vaginal ring, injectable and implant) and IUD (inert, copper and hormonal)