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Factors associated with post-abortion contraceptive discontinuation

Fatores associados à descontinuidade no uso de métodos contraceptivos após a vivência de um abortamento

Factores associados a la discontinuidade en el uso de métodos anticonceptivos después de sufrir un aborto

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ABSTRACT

Objectives: To assess factors associated with post-abortion contraceptive discontinuation.

Method: This cross-sectional study addressed 111 women aged 18-49 attending Primary Health Care Facilities in São Paulo/SP, Aracaju/SE, and Cuiabá/MT, Brazil, who reported an abortion five years before the interview held in 2015-2017. Kaplan-Meier estimates and Cox Regression were used for data analysis.

Results: Oral hormonal contraceptives, male condoms, and injectable contraceptives were the methods most frequently used. The contraceptive discontinuation rate was 41.8% in the 12 months after the abortion. The pill was the method most frequently abandoned (58.3%); male condoms were the method that failed the most (72.7%), and injectable contraceptives were the method most frequently switched (50.0%). Being up to 24 years old, having ten or more years of education, having three or more children, and a desire to wait longer before becoming pregnant again were associated with post-abortion contraceptive discontinuation.

Conclusion: Short-acting contraceptive methods were predominant among post-abortion women. The type of discontinuation varied according to the type of method used. The factors associated with contraceptive discontinuation were age, education, parity, and reproductive intention.

Keywords: Contraception. Abortion. Contraceptives, oral. Contraceptive agents, hormonal. Condoms. Sexual and reproductive health.

RESUMO

Objetivos: Analisar os fatores associados à descontinuidade no uso de método contraceptivos após a vivência de um abortamento. **Método:** Estudo transversal, conduzido com 111 mulheres de 18-49 anos, usuárias de Unidades Básicas de Saúde de São Paulo/SP, Aracaju/SE e Cuiabá/MT, que relataram abortamento nos cinco anos anteriores às entrevistas realizadas entre 2015-2017. Utilizou-se Kaplan-Meier e regressão de Cox para análise dos dados.

Resultados: Os métodos mais utilizados foram o contraceptivo hormonal oral, preservativo masculino e injetáveis. A taxa de descontinuidade contraceptiva foi 41,8% nos 12 meses. A pílula foi o método mais abandonado (58,3%); o preservativo masculino aquele que mais falhou (72,7%); e injetáveis os mais trocados (50,0%). Ter até 24 anos de idade, mais de 10 anos de escolaridade, três ou mais filhos e querer esperar mais para engravidar associaram-se a descontinuar o uso dos métodos contraceptivos após o abortamento.

Conclusão: Após o abortamento, as mulheres usaram predominantemente métodos contraceptivos de curta duração. O tipo de descontinuidade, abandono, troca ou falha, variou conforme o método usado. Os fatores associados à descontinuidade contraceptiva foram a idade, a escolaridade a paridade e a intenção reprodutiva.

Palavras-chave: Anticoncepção. Aborto. Anticoncepcionais orais. Contraceptivos hormonais. Preservativos. Saúde sexual e reprodutiva.

RESUMEN

Objetivos: Analizar los factores asociados a la discontinuidad en el uso de métodos anticonceptivos después de un aborto. **Método:** Estudio transversal realizado con 111 mujeres de 18 a 49 años, usuarias de Unidades Básicas de Salud de São Paulo/SP, Aracaju/SE y Cuiabá/MT, quienes reportaron aborto en los cinco años previos a la entrevista realizada entre 2015-2017. Se utilizó Kaplan-Meier y la regresión de Cox para el análisis de datos.

Resultados: Tras el aborto, los métodos utilizados se centraron en los de corta duración: anticonceptivos hormonales orales, condones masculinos e inyectables. La tasa de discontinuidad en el uso de métodos anticonceptivos fue del 41,8% en los 12 meses posteriores al aborto. La píldora fue el método que se abandonó con más frecuencia (58,3%); el condón masculino en el que ocurrieron más fallas (72,7%); e inyectables intercambiados con mayor frecuencia (50,0%). Tener 24 años o más, 10 o más años de escolaridad, alta paridad (3 o más) y desear esperar para quedar embarazada se asociaron con la discontinuidad en el uso de métodos anticonceptivos después del aborto.

Conclusión: Las mujeres después de un aborto utilizaron predominantemente métodos anticonceptivos de corta duración, que con mayor frecuencia se suspenden. El tipo de discontinuidad, abandono, intercambio o falla varió según el tipo de método utilizado. La edad, la educación, la paridad y la intención reproductiva se asociaron con la discontinuidad en el uso de métodos anticonceptivos después del aborto. **Palabras clave:** Anticoncepción. Aborto. Anticonceptivos orales. Agentes anticonceptivos hormonales. Condones. Salud sexual y reproductiva.

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Nearly 56 million induced abortions were estimated per year between 2010 and 2014 worldwide; 45% of these are thought to refer to unsafe abortions⁽¹⁾, i.e., abortions performed by untrained persons or in an environment that does not comply with minimum medical standards. Unsafe abortions are the leading cause of maternal morbidity and mortality⁽²⁾ and are frequent in countries where abortion is illegal⁽²⁾, as in Brazil. The Brazilian National Abortion Survey, conducted in 2016 with women aged 18 to 49, reports that even under legal restrictions, almost one in every five women had already terminated a pregnancy up to the age of 40⁽³⁾. Spontaneous abortions are estimated to occur in approximately 13% of pregnancies, affecting 10% of women⁽⁴⁾.

In 2014, the Brazilian Ministry of Health launched the second issue of the technical standard *Atenção Humanizada ao Abortamento* [Humanized Abortion Care] to improve the care provided to women experiencing a spontaneous or induced abortion and decrease related maternal morbidity and mortality⁽⁵⁾. The following stand out among recommendations provided to women experiencing an abortion: provide contraceptive methods immediately post-abortion, even during hospitalization, to meet the women/couple's reproductive intentions, and also to ensure women wait at least three months before a subsequent pregnancy. Contraceptive methods are also crucial in induced abortions to decrease the risk of new abortions⁽²⁾.

One study conducted in Brazil reports that most women experiencing an abortion used a short-acting contraceptive method such as a male condom or oral contraceptive pills⁽⁶⁾. However, these methods present the highest discontinuation rates because they require women to be disciplined and motivated; do not require the action of a health worker to interrupt them; and in the case of male condoms, women need to negotiate their partners' adherence⁽⁷⁾. Therefore, even though most women adopt a contraceptive method in the months after an abortion, a significant portion of women do not adopt these methods continually, whether because they abandon or switch the contraceptive method or get pregnant despite the method. These are known as contraceptive discontinuation⁽⁸⁾, the concept on which this study is based.

Few studies in Brazil address post-abortion contraceptive discontinuation. Studies conducted in socially and culturally diverse contexts, such as India, Nepal, and China, show that contraceptive discontinuation is relatively frequent between six and 12 months after an abortion and is more common among women with lower educational levels and those taking oral hormonal contraceptives^(9–11).

This study adopted the following guiding question: "What are the aspects associated with contraceptive discontinuation among women experiencing an abortion?" Therefore, this study's objective was to analyze the factors associated with post-abortion contraceptive discontinuation.

METHOD

This quantitative cross-sectional study integrates a larger investigation titled: "Padrões e determinantes das descontinuidades contraceptivas e o papel da anticoncepção de emergência" [Patterns and determinants of contraceptive discontinuation and the role of emergency contraception], addressing a sample composed of women aged between 18 and 49, attending Primary Health Care Facilities (UBS) located in São Paulo/SP (2015), Aracaju/SE (2016), and Cuiabá/MT (2017), Brazil. These three capitals were chosen to be this study setting because they are located in different Brazil-ian regions (southeast, northeast, and midwest), enabling identifying the contraceptive methods adopted by wom-en with heterogeneous social and cultural profiles using public primary health care health services with different organization patterns.

Sample size calculation for the larger study was based on the following: proportion of women using a contraceptive method⁽¹²⁾, 95% confidence level, 5% sampling error, and design effect (DEFF) equal to 2 (i.e., n=768 women in São Paulo, and n=385 in Aracaju and Cuiabá). Another 25% was added to replace potential refusals or losses, and 33% to replace illegible women due to exclusion criteria (i.e., never had sexual intercourse or having a tubal ligation or a partner who had a vasectomy more than five years ago), requiring at least 1,000 valid interviews in São Paulo, and 482 in Aracaju and Cuiabá.

Cluster sampling was implemented in two stages. In the first stage, the UBS were drawn with a probability proportional to their size, measured by the number of cervical-vaginal cytopathological tests performed in 2014. According to this criterion,78 UBS were included:38 UBS out of 441 UBS in São Paulo; 19 out of 43 in Aracaju; and 19 out of 93 in Cuiabá. In the second stage, non-probabilistic sampling was used to recruit women in the waiting rooms of each of the previously selected UBS according to the following criteria: 1) waiting for a cervical-vaginal cytopathological test; 2) waiting for medical or nursing consultation; 3) waiting for any other procedure within the UBS.

In the three capitals, data were collected during three consecutive days in each UBS; nine women were interviewed per day so that 27 valid interviews were obtained per day in each UBS. Finally,1,030 valid interviews were obtained in São Paulo, 508 in Aracaju, and 513 in Cuiabá, totaling 2,051 women.

This study used a subsample of the larger project and considered only the 111 women who reported an abortion in the five years before the interview, regardless of whether it was an induced or spontaneous abortion. The decision not to ask about the abortion etiology was based on the fact that induced abortions are restricted in Brazil, which would possibly result in underreporting⁽¹³⁾. Additionally, since the World Health Organization (WHO) defines abortion as the interruption of pregnancy up to the 20th and 22nd week⁽²⁾, only women whose abortions occurred in the first trimester of pregnancy were considered. Nonetheless, no women needed to be excluded because all abortions met this criterion.

Researchers with a bachelor's degree in the health field used tablets to collect data through face-to-face interviews held in medical offices in the UBS premises. Note that the researchers received face-to-face training provided by the study's coordinators in each of the capitals. The interviews lasted approximately 20 minutes. In addition to collecting the women's sociodemographic data and reproductive history using a structured instrument, information regarding the women's contraceptive practices was collected according to the Demographic and Health Survey (DHS) Contraceptive Calendar, a monthly retrospective history of pregnancies, births, terminations, and the use of contraceptive methods in the five years prior to the interview⁽⁸⁾. The contraceptive method used in each month of the calendar (72 months in total) should be provided, even if no method was used at the time. The Calendar also allows for reporting whether no contraceptive method was used in specific situations, such as in pregnancies, terminations, or childbirths.

All data analyzed in this study on contraceptive discontinuation concern segments of the use of contraceptive methods adopted post-abortion. A segment of use of contraceptive methods is the unit of analysis and is defined as the period from the month in which a method was adopted up to the month in which the method was discontinued, either because women abandoned or switched the method, or yet the method failed. Hence, it means a woman may have had many segments of use of contraceptive methods after an abortion if she interrupted and then resumed the use of contraceptives more than once. On the other hand, some women might not have contributed to any segment if they did not use contraceptive methods up to 12 months after abortion. Segments resulting in pregnancy were censored.

Statistical analysis was performed with R for Windows in two stages: in the first stage, the interval of time up to when a contraceptive method was adopted after abortion was investigated. In the second stage, the interval of time up to when the contraceptive method was discontinued within the 12 months after abortion was investigated. Only the first contraceptive method initiated was considered here. Additionally, information about why women discontinued contraceptive methods and when it occurred was also collected. The dependent variable was the interval of time between both stages. The Kaplan-Meier graph was used to estimate survival rates of the outcomes of interest: when the method was initiated and when the method was discontinued.

The Cox proportional hazards model, also called the Cox regression model, was used to assess the joint effects of the variables on time up to when the contraceptive method was discontinued. Initially, a complete fitted model was used; that is, all the variables of interest were included (age at the time of the abortion, education, economic status - according to Brazilian criteria⁽¹⁴⁾ –, age at the time of the first pregnancy, race, stable union, occupation, number of children, and reproductive intention), not presented here. Then, the variables were excluded, one at a time, until the final model included only significant variables (the level of significance adopted to assess the covariates in the fitted models was 0.05), i.e., the model that best explained the time interval up to when the contraceptive method was discontinued. Finally, the assumption of proportionality was assessed using the Cox-Snell residual plot, not presented here.

The study project was submitted to and approved by the Institutional Review Boards at the College of Nursing at the University of São Paulo and the Health Department at the city of São Paulo (CAAE 40558714.8.3001.0086). Since neither of the Health Departments in Aracaju and Cuiabá had an Institutional Review Board, the collection of data in these capitals was analyzed via an addendum to the previously mentioned process (CAAE 40558714.8.0000.5392). All the participants signed free and informed consent forms after receiving clarification regarding the study's objectives and procedures. After the interviews, all women received guidance regarding contraceptive methods, and all their doubts were clarified. The tablets used in the interviews contained audiovisual material concerning family planning that could be used if needed.

RESULTS

The sociodemographic and reproductive variables concerning women who experienced an abortion are presented in Table 1.

Altogether, 118 abortions were reported in the period (five years prior to the interview), meaning that some women reported more than one abortion (n=6). No contraceptive method was adopted by 38 of these women in the 12 months after the abortion. Therefore, data concerning contraceptive methods and contraceptive discontinuation concern 80 segments of the use of contraceptive methods post-abortion. At least one contraceptive method was adopted in the first month post-abortion in more than 40% of the cases. At the end of the 12 months, more than 70% of abortions were followed by a contraceptive method; the pill and male condoms were the methods most frequently used.

Considering the 80 segments in which a contraceptive method was adopted after abortion, the oral hormonal contraceptive was the method more likely to be adopted, followed by male condoms, and later, injectable contraceptives (Figure 1). The graph also shows that 12 months post-abortion, the proportion of contraceptive use was stable from the time it was initiated: the pill was used in 30% of the segments, and male condoms were used in slightly more than 20%.

Of the 80 segments concerning contraceptive use in the 12 months post-abortion, 29 were discontinued. The cumulative distribution function shows that 12.5% of the segments were discontinued three months after the method had been adopted. At the end of the 12 months, 41.8% of the contraceptive methods had been discontinued (Figure 2).

The reasons for contraceptive discontinuation included: women became pregnant while using the method (34.6%); they wanted to become pregnant (17.2%); adverse side effects (17.2%); and other reasons (31.0%) such as infrequent sex or a more effective method was chosen. Considering all the segments, 15.0% ended because women abandoned the method, 13.7% failed, while 7.5% switched. The type of discontinuation varied according to the method used: the pill was the method with the highest proportion of abandonment (58.3%); the method failed more frequently among those using male condoms (72.7%), and half of the participants (50.0%) using injectable contraceptives switched to another method (Table 2).

Variable	n	%
Age (years)		
Up to 24 years old	38	34.2
From 25 to 35 years old	50	45.0
Older than 35 years old	23	20.7
Race		
Caucasian	30	27.0
Mixed/Afro-descendant	75	67.6
Others	06	5.4
Schooling (years)		
Up to 7	15	13.5
From 8 to 10	28	25.2
More than 10	68	61.3

Table 1 – Sociodemographic and reproductive characteristics of women who experienced an abortion in São Paulo, Aracaju, and Cuiabá, Brazil from 2015 to 2017

Table 1 - Cont.

Variable	n	%
Socio-economic class		
A/B	22	19.8
С	67	60.4
D/E	22	19.8
Stable union		
No	17	15.3
Yes	94	84.7
Age of the first pregnancy (years)		
Up to 17	20	18.0
From 18 to 24	64	57.7
Older than 24	27	24.3
Number of children		
None	34	30.6
One or two	57	51.4
Three or more	20	18.0
Reproductive intention when became pregnant*		
Did not want (more) children	26	23.4
Wanted to get pregnant at the time	48	43.2
Wanted to wait longer to get pregnant	35	31.5
Total	111	100.0

Source: Study's data, 2015–2017. Note: *Two women did not answer

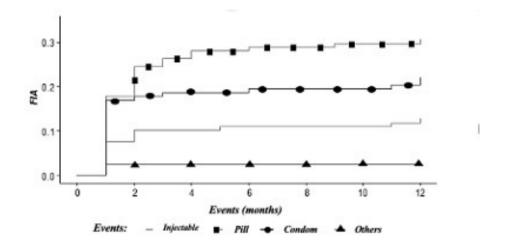


Figure 1 – Cumulative incidence functions of time from the beginning of the use of the contraceptive method to the four potential events (types of methods), in São Paulo, Aracaju and Cuiabá, Brazil for 2015-2017.

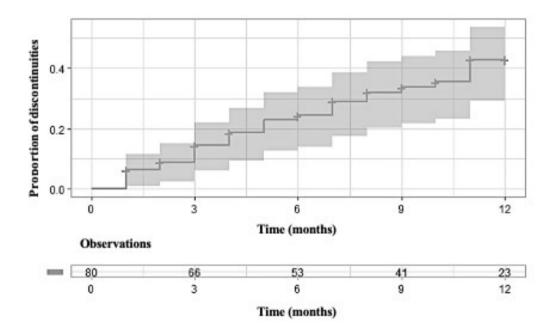


Figure 2 – Kaplan-Meier's cumulative distribution function of time to some discontinuity in the use of contraceptive methods in São Paulo, Aracaju, and Cuiabá, from 2015 to 2017. Source: Study's data, 2015-2017.

The final Cox regression model, which enables analyzing the combined effect of the variables on time elapsed until the contraceptive method was discontinued (Table 3), shows that women younger than 25 years old were 3.84 times more likely to discontinue the method than women aged between 25 and 35 (p=0.030) (284% higher). Regarding education, women with more than ten years of schooling were 7.46 times more likely to discontinue the contraceptive method than those with up to seven years of schooling (p=0.016) (646% higher). In turn, considering the number

Method	Types of discontinuation			
	Abandonment	Failure	Replacement	
Injectable	1 (8.3%)	0 (0.0%)	3 (50.0%)	
The pill	7 (58.3%)	2 (18.2%)	1 (16.7%)	
Male condom	4 (33.3%)	9 (72.7%)	2 (33.3%)	
Other*	0 (0.0%)	1 (9.1%)	0 (0.0%)	
Total	12 (100%)	11 (100%)	6 (100%)	

Table 2 – Distribution of contraceptive methods used post-abortion according to type of contraceptive discontinuation. São Paulo, Aracaju, and Cuiabá, Brazil from 2015 to 2017.

Source: Study's data, 2015-2017.

*Coitus withdrawal

of children alive, in which the category "no children" was the reference, women with three or more children (p=0.001) were 18.08 times more likely to discontinue the method (p=0.001) (1,708% higher). Finally, women who wanted to wait longer to have children were 3.45 times more likely to discontinue the method than those who did not want (more) children (p=0.043) (245% higher). The Cox-Snell residuals were used to analyze the model fit and confirmed it was adequate to explain time elapsed since the beginning of contraceptive use up to its discontinuity.

Although the group of women reporting an abortion in the last five years was small, possibly because abortion is highly stigmatized in Brazil, the participants addressed in this study seem to represent a broad spectrum of the female population in general in terms of sociodemographic characteristics. The sample comprised from young women to those at the end of reproductive life, women with little education and a high educational level, belonging to different economic classes, and presented different reproductive trajectories, living in three capitals in different Brazilian regions.

The adoption of contraceptive methods after the abortion was similar to that reported in Brazil,⁽⁶⁾ India,⁽⁹⁾ and another ten Asian and African countries⁽¹⁵⁾. Women started using contraceptive methods around the first to the second month post-abortion. The methods most frequently used were the pill and male condoms; the latter remained in the second position over time. Even though women usually become fertile again up to two weeks after an abortion⁽⁵⁾, the Brazilian Ministry of Health⁽⁵⁾ advises women against becoming pregnant three months after an abortion. The WHO⁽¹⁶⁾ advises waiting up to six months post-abortion due to an increased risk of repeated abortion, though this is controversial⁽¹⁷⁾. Most women adopted short-acting contraceptive methods after abortion. Short-acting methods are subject to greater risk of failure so that these women were vulnerable to becoming pregnant again before the recommended interval.

Comparing the discontinuation rate observed in our study with those reported by other studies demands caution, as most studies were conducted in contexts where induced abortion is legal. Furthermore, we could not differentiate between spontaneous and induced abortions because a direct question about the etiology of abortion would result in socially desirable answers, i.e., biased answers⁽¹³⁾. In any case, the study conducted in India found a discontinuation rate equal to 27.2%⁽⁹⁾, while in Nepal, it was 62.0%⁽¹¹⁾. Finally, it is worth noting that part of women who discontinued the contraceptive method reported the desire to become pregnant, indicating that the reproductive intention at the post-abortion period seemed to influence the choice of using or not a contraceptive method and the choice of abandon/switch the method; the latter was confirmed by multiple analysis.

Abandoning the contraceptive method was the most common type of discontinuation, almost in the same magnitude as failures. Similar to China⁽¹⁰⁾, the types of discontinuation varied according to the contraceptive method used. **Table 3** – Estimates, standard error, and p-value of the parameters of the final model fitted by Cox for time until the contraceptive method was discontinued in São Paulo, Aracaju, and Cuiabá, Brazil from 2015 to 2017.

Variables	Fitted hazard ratio	Standard-error	p-value
Age at the time of abortion (years)			
Up to 24	3.84	1.86	0.030
From 25 to 35	ref	-	-
More than 35	1.87	1.87	0.317
Schooling (years)			
Up to 7	ref	-	-
Between 8 and 10	1.39	2.32	0.695
More than 10	7.46	2.31	0.016
Number of children			
None	ref	-	-
One or two	2.49	1.67	0.076
Three or more	18.08	2.26	0.001
Reproductive intention when became pregnant			
Did not want (more) children	ref	-	-
Wanted to become pregnant at the time	1.98	1.87	0.276
Wanted to wait longer to become pregnant	3.45	1.84	0.043

Source: Study's data, 2015-2017.

The pill was the method most frequently abandoned, as studies conducted in other countries⁽⁷⁾ confirm, however, differently from what had been observed in Brazil⁽¹⁷⁾. Similar to India,⁽⁹⁾ failure was the most frequently observed among those using male condoms, as these are not very effective⁽¹⁸⁾. Women using injectable contraceptives most frequently switched this method. Studies report that women switch this method even when not in a post-abortion situation, probably because of the numerous side effects associated with its use⁽¹⁹⁾.

The analyzes show that women who are more likely to discontinue contraceptive methods are younger, well educated, with three or more children, and wanted to become pregnant when the abortion occurred. In India, it was also observed that parity was associated with contraceptive discontinuation and reproductive intention⁽⁹⁾.

Women may have discontinued the use of contraceptive methods for two apparently antagonistic reasons; however, this makes sense in a context in which abortion is illegal, and one cannot precisely identify the etiology of these events^(13,20). Hence, some women probably wanted to become pregnant immediately after the abortion. For this reason, they initiated the use of a contraceptive method but discontinued it after a while to become pregnant. Other women wanted to prevent a new pregnancy and initiated with the most accessible method, such as condoms or the pill, until they could use a more effective method. It possibly explains the high rate of contraceptive discontinuation among women using short-acting methods. We could not determine whether the younger or more educated women discontinued the contraceptive method for one reason or another; the small number of events prevented a stratified analysis. Nonetheless, the possibility that they discontinued the contraceptive method to adopt a "better" method weeks or months later is not discarded. Qualitative studies are needed to understand reproductive history/intention and contraceptive discontinuation, especially among women experiencing an abortion.

In any case, our findings enabled building upon the knowledge in guidelines and the literature regarding the need to provide contraceptive counseling and supplies as part of post-abortion care^(5,16). Such care should include strategies to help women acknowledge that they will be fertile soon, and for this reason, need to use contraceptive methods for at least three months before attempting to become pregnant again. Those not intending to become pregnant soon need a method that meets their reproductive goals and health conditions. Therefore, not only Long-Acting Reversible Contraceptives (LARC) should be available during the hospitalization^(2,5,20), given their high efficacy and safety⁽¹⁸⁾, but all methods available through the Brazilian Unified Health System (SUS) should be offered, respecting eligibility criteria and the women/couples' choices.

The discontinuation rate in the use of contraceptive methods after an abortion among women attending UBS located in three Brazilian capitals was 41.8% in the first 12 months after the event. Discontinuation differs according to the type of contraceptive used. The pill was the method most frequently abandoned; condoms presented the highest rate of failures, and injectable contraceptives were the method most frequently switched. The sociodemographic and reproductive characteristics associated with contraceptive discontinuation after an abortion were age (being 24 years old), education (having more than ten years of schooling), parity (having three or more children), and reproductive intention (desire to wait longer to become pregnant). This study's limitations include the fact that we could not identify whether abortion was induced or spontaneous. This fact certainly interferes with women's contraceptive choices during the post-abortion period. This limitation is common among other studies conducted in Brazil when addressing this group. The second limitation is that only women attending SUS were addressed here; hence, these results do not apply to women using private health services. The third limitation is that data collected depend on the women's reports. Thus, there may be inaccurate or incorrect data, considering abortion is taboo in Brazilian society. Additionally, even though the interviewers were women with a background in the health field and received appropriate training, we should bear in mind that because abortion is a highly stigmatized event, underreporting is a possibility in Brazil.

Despite its limitations, this study presents relevant contributions to the sexual and reproductive health of women experiencing an abortion. This study reinforces the importance of investigating the occurrence of abortions and learning about the contraceptive dynamics after this event, which is crucial for primary health care workers to understand the reproductive needs of women and couples to prevent a new pregnancy before a minimum of three months or unintended pregnancies. It means that post-abortion care should not only encourage women and couples to adopt a contraceptive method immediately after the event, respecting eligibility criteria, but also maintain its use. Additionally, it is essential to tailor the care provided to women in this situation, as younger women and those with more children are more likely to discontinue the contraceptive method within 12 months post-abortion.

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