

Profile of synthetic drugs and herbal medicines used by pregnant women seen in basic health unit in northern Ceará State, Brazil

Perfil do uso de medicamentos sintéticos e fitoterápicos por gestantes atendidas em uma Unidade Básica de Saúde localizada na região norte do Ceará

Perfil de utilización de medicamentos sintéticos y fitoterápicos por mujeres embarazadas atendidas en Unidad Básica de Salud ubicada en la región norte de Ceará

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Abstract

Introduction: There is a shortage of clinical data on drugs in pregnant patients. To assist in the management of pharmacotherapy in these patients, the Food and Drug Administration (FDA) created, in 1979, rules for classification of pregnancy risk for drugs. In addition, in Brazil, there is use of phytotherapies by the population, linked to socio-cultural and economical factors, at times without knowing what risks medicinal plants can bring to patients, especially in pregnant women. **Objective:** To describe the use of synthetic drugs and herbal medicines by pregnant women seen at a Basic Health Unit, reporting the socioeconomic profile and historical parity of the interviewees and classifying the gestational risk of the medicines used. **Methods:** This is an exploratory, descriptive research, with a qualitative approach, in a Basic Health Unit located in a provincial city of Ceará. Pregnant women who underwent prenatal care at the unit in any gestational trimester were included in the study, and those under age were excluded. Data was collected using a structured form, after the participants signed the Free and Informed Consent Form and charted using Microsoft Excel 365. The risk classification of drugs was carried out using the FDA criteria and medicinal plants were classified according to the results obtained in the literature under "Indicated", "Indicated with reservations" or "Admonished". Study approved by the Research Ethics Committee, under the file 3,569,328. **Results:** A total of 43 pregnant women participated, of which 15 (34.88%) had some type of comorbidity, with gestational diabetes, allergic rhinitis and hypertension being the most prevalent. 41 participants (95.35%) used some medication during pregnancy, with emphasis on medications with risks on B and C (84.44% of the total). Regarding the use of phytotherapy, 13 pregnant women (30.23%) used some medicinal plant, where only one of the species described was Indicated with reservations during pregnancy. **Conclusions:** It was observed that one of the factors associated with use of medications during pregnancy is the beginning of prenatal care. Although pregnant women avoid the use of synthetic medicines without indication, the same does not happen on the use of phytotherapy, which is carried out indiscriminately. In addition, the lack of studies on the risks of medications during pregnancy and the absence of pharmacists in prenatal care, a professional capable of promoting rational use of medications who could improve the profile of medication used by these patients.

Keywords: Drug utilization; Prenatal care; Medicinal plants; Pregnancy.

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Resumo

Introdução: Há escassez de dados clínicos sobre os medicamentos em pacientes gestantes. Para auxiliar na conduta da farmacoterapia nessas pacientes, a *Food and Drug Administration* (FDA) criou, em 1979, normas de classificação de risco gestacional para os medicamentos. Além disso, no Brasil, há o uso de fitoterapia pela população, atrelada a fatores socioculturais e econômicos, por vezes sem que se saiba quais os riscos que as plantas medicinais possam trazer aos pacientes, sobretudo em gestantes. **Objetivo:** Descrever o uso de medicamentos sintéticos e fitoterápicos por gestantes atendidas em uma Unidade Básica de Saúde, relatando o perfil socioeconômico e histórico de paridade das entrevistadas e classificando o risco gestacional dos insumos utilizados. **Métodos:** Trata-se de uma pesquisa exploratória, descritiva, com abordagem qualitativa, em uma Unidade Básica de Saúde localizada no interior do Ceará. Foram incluídas no estudo as gestantes que realizavam acompanhamento pré-natal na unidade, em qualquer trimestre gestacional, sendo excluídas aquelas menores de idade. Os dados foram coletados por meio de um formulário estruturado, após as participantes assinarem o Termo de Consentimento Livre e Esclarecido. Os dados foram tabulados utilizando o Microsoft Excel 365. A classificação de risco dos medicamentos foi realizada utilizando os critérios do FDA, e as plantas medicinais foram classificadas de acordo com os resultados obtidos na literatura em “Indicadas”, “Indicadas com ressalvas” ou “Contraindicadas”. Estudo aprovado pelo Comitê de Ética em Pesquisa, com número do parecer 3.569.328. **Resultados:** Participaram um total de 43 gestantes, das quais 15 (34,88%) apresentaram algum tipo de comorbidade, sendo diabetes gestacional, rinite alérgica e hipertensão as mais prevalentes. 41 participantes (95,35%) utilizaram algum medicamento durante a gestação, com destaque de medicamentos de risco B e C (84,44% do total). Em relação ao uso de fitoterapia, 13 gestantes (30,23%) fizeram uso de alguma planta medicinal, onde somente uma das espécies utilizadas apresentou ser indicada com ressalvas durante a gestação. **Conclusões:** Observou-se que um dos fatores associados com o uso de medicamentos na gestação é o início do pré-natal. Apesar de as gestantes evitarem o uso de medicamentos sintéticos sem indicação, o mesmo não ocorre em relação ao uso de fitoterapia, que é realizado de forma indiscriminada. Ademais, ressalta-se a falta de estudos dos riscos de medicamentos durante o período gestacional e a falta do farmacêutico no acompanhamento pré-natal, profissional capaz de promover Uso Racional de Medicamentos, podendo melhorar o perfil de uso de medicamentos por essas pacientes.

Palavras-chave: Uso de medicamentos; Pré-natal; Plantas medicinais; Gestação.

Resumen

Introducción: Los datos clínicos sobre medicamentos en mujeres embarazadas son escasos. Para ayudar en la realización de la farmacoterapia en estos pacientes, la Administración de Alimentos y Medicamentos (FDA) creó, en 1979, reglas para la clasificación del riesgo gestacional de los medicamentos. Además, en Brasil, la fitoterapia es utilizada por la población, vinculada a factores socioculturales y económicos, a veces sin conocer los riesgos que las plantas medicinales pueden traer a los pacientes, especialmente a las mujeres embarazadas. **Objetivo:** Describir el uso de medicamentos sintéticos y herbales por gestantes atendidas en una Unidad Básica de Salud, reportando el perfil socioeconómico y paridad histórica de las entrevistadas y clasificando el riesgo gestacional de los insumos utilizados. **Métodos:** Se trata de una investigación exploratoria, descriptiva, con enfoque cualitativo, en una Unidad Básica de Salud ubicada en el interior de Ceará. Se incluyeron en el estudio las mujeres embarazadas que se sometieron a atención prenatal en la unidad en cualquier trimestre de gestación y se excluyeron las menores de edad. Los datos fueron recolectados a través de un formulario estructurado, luego de que los participantes firmaran el Formulario de Consentimiento Libre e Informado. Los datos se tabularon mediante Microsoft Excel 365. La clasificación de riesgo de los fármacos se realizó según los criterios de la FDA y las plantas medicinales se clasificaron según los resultados obtenidos en la literatura en “Indicados”, “Indicados con reservas” o “Contraindicados”. Estudio aprobado por el Comité de Ética en Investigación, con dictamen número 3.569.328. **Resultados:** Participaron un total de 43 gestantes, de las cuales 15 (34,88%) presentaban algún tipo de comorbilidad, siendo la diabetes gestacional, rinitis alérgica e hipertensión las más prevalentes. 41 participantes (95,35%) utilizaron algún medicamento durante el embarazo, destinado a medicamentos de riesgo B y C (84,44% del total). En cuanto al uso de fitoterapia, 13 gestantes (30,23%) utilizaron alguna planta medicinal, donde solo una de las especies utilizadas se indicó con reservas durante la gestación. **Conclusiones:** Se observó que uno de los factores asociados al uso de medicamentos durante el embarazo es el inicio de la atención prenatal. Si bien las mujeres embarazadas evitan el uso de medicamentos sintéticos sin indicación, no ocurre lo mismo con relación al uso de fitoterápicos, que se realiza de forma indiscriminada. Además, la falta de estudios sobre los riesgos de los medicamentos durante el embarazo y la falta de farmacéuticos en la atención prenatal, un profesional capaz de promover el Uso Racional de los Medicamentos, puede mejorar el perfil de uso de medicamentos por parte de estas pacientes.

Palabras clave: Utilización de medicamentos; Atención prenatal; Plantas medicinales; Embarazo.

INTRODUCTION

During pregnancy, morphophysiological changes occur in the woman's body that can affect the pharmacokinetics of the medications administered to her.^{1,2} The placenta carries out the selective transport of molecules between the mother and the fetus, which can expose the embryo/fetus to adverse pharmacological and/or teratogenic effects of drugs.³⁻⁵ The episode involving thalidomide — a medication originally marketed as an antiemetic for pregnant women and later associated with the occurrence of

phocomelia — was one of the milestones that contributed to improving understanding of the function of the placenta and for the development of pharmacovigilance, transforming the approach to pharmacotherapy in pregnant women.^{6,7}

In general, pregnant women are not included in clinical trials for the approval of new drugs (except when it comes to specific drugs for this group), which makes it difficult to identify possible risks for these patients.^{3,6} It is therefore necessary to resort to pharmacovigilance to obtain this information. This phase, corresponding to phase IV in clinical trials, occurs after the drug is released for marketing and allows describing the adverse effects and risks of recently launched medicines, in conditions and groups of patients that could not be tested in the other phases.^{5,6,8}

The United States Food and Drug Administration (FDA) already maintained a pregnancy risk classification for marketed medicines, based on data on the risks and teratogenicity already observed in humans and animals. This classification covered five levels:

- A – drugs that have not shown any adverse effects on pregnancy in the studies carried out;
- B – drugs that have not demonstrated teratogenic effects in animals, but still lack studies in humans;
- C – drugs with no studies in animals and humans;
- D – drugs that demonstrated risks for pregnancy, but whose risk-benefit ratio should be considered; and
- X – drugs with substantial evidence of risk to the fetus, for which prescription is not indicated, regardless of the benefits to the pregnant woman.

Although this classification is no longer in force since 2015,⁹ its use as a reference is still observed. In Brazil, RDC 137/2003 is in force, which establishes the use of warnings on medication leaflets and packaging regarding pregnancy risks.¹⁰

Furthermore, in less developed countries, such as Brazil, the use of medicinal plants and herbal medicines is notable,¹¹ with a growing increase in their prescription due to the greater attention of health agencies and their inclusion in primary care,⁸ according to standards such as RDC 18/2013, which regulates Farmácias Vivas in primary care,¹² and RDC 26/2014, which regulates the registration of herbal medicines.¹³ However, it is common for these products to be sold having low quality, also through indiscriminate sales and with self-medication.^{8,11} In the case of pregnant women, these products are sometimes used for common problems, without considering their potential risks.^{5,11}

Therefore, it is important to evaluate the use of medications by pregnant women, both synthetic and homemade, generally produced from medicinal plants, in order to analyze the risks to which these patients are exposed. The objective of this study was to describe the profile of the use of drugs and herbal medicines by participating pregnant women, reporting their socioeconomic profile, pregnancy history and comorbidities, observing at what point in pregnancy these women are most likely to use medications and herbals and classifying these products according to their pregnancy risk.

METHODS

This study consisted of exploratory, descriptive research, with a quantitative approach, whose objective was to outline the profile of medication use by pregnant women treated at a basic health unit (UBS) located in the city of Sobral (CE). Data were collected between August and October 2019. Data collection took place during the participants' prenatal consultations at the health unit.

To be included in the study, participants needed to be pregnant, in any of the three gestational trimesters, and be undergoing prenatal care at the health unit. Those who were under 18 years of age and those who chose not to participate in the study were excluded.

Data collection was carried out through interviews conducted using a previously prepared structured form. The interviews took place in a private location in the health unit, thus guaranteeing the confidentiality of the information. All study participants signed an informed consent form, allowing the use of their data in the research.

The collected data were tabulated using the Microsoft Excel 365 program and expressed in absolute and relative values.

To classify the risk of drugs, the Micromedex Solutions and Drugs.com databases were used, following the old FDA criteria. When the pregnancy risk classification was not available in these databases, medication leaflets were used. With regard to medicinal plants, a literature search was carried out to determine the indication of each one during pregnancy. Since these plants did not meet the FDA's old criteria, they were classified as "Indicated", "Indicated with reservations" or "Contraindicated" during pregnancy. When no evidence of pregnancy risk in humans was found in the researched literature, the plants were classified as "No report".

The risks associated with the study involved possible discomfort during the interview, such as waiting time and duration. Participants were informed of the anticipated waiting time before the interview began to ensure their understanding of the process. Furthermore, there was a concern to maintain the confidentiality of the information collected. Only the researcher and the research supervisor had access to the completed interview forms, thus minimizing any risk of breach of confidentiality.

The benefits of the study included the elaboration of the profile of the use of synthetic drugs and natural medicines (herbal and homemade) by pregnant women, together with the classification of the risks of these medicines. This will provide important information for health services and the monitoring of these patients, with the aim of raising awareness about the Rational Use of Medicines, preventing adverse events related to medicines and avoiding risks to both the developing embryo or fetus and pregnant patients.

The study was conducted in accordance with Resolution No. 466/12 of the Research Ethics Committee of the Instituto Superior de Teologia Aplicada and was accepted with Approval No. 3.569.328.

RESULTS

During the study period, 48 pregnant women were approached, of which 43 were included (three were minors and two chose not to participate in the study). The number of pregnant women approached was due to the short collection period (August to September 2019) and delays in the procedures for approval of the research with the Research Ethics Committee. Table 1 describes the sociodemographic characteristics of the pregnant women included in the study.

The majority of pregnant women included in the study were in the age group of 18 to 35 years (88.37%), not at risk of pregnancy related to age, according to the criteria of the Ministry of Health (MS), which establish an age range of less than 15 years and more than 35 years as risk factors.¹⁵ Thirty-four of them had a steady partner (20 in a stable relationship and 14 married), 18 (41.86%) of which had completed high school, with no record of illiteracy.

Regarding family income, 20 (46.51%) of the participants had an income that varied between 1 and 1.5 minimum wages. Among the participants, 19 (44.19%) were in the 2nd trimester of pregnancy, 16 (37.21%) in the 3rd trimester and 7 (16.28%) in the 1st trimester. Only one (2.33%) did not know how

Table 1. Sociodemographic profile, parity history and gestational trimester of pregnant women included in the study.

	n	%
Age (years)		
18–35	38	88.37
>35	5	11.63
Total	43	
Marital status		
Single	9	20.93
Stable relationship	20	46.51
Married	14	32.56
Widowed	0	0.00
Total	43	
Schooling		
Incomplete primary education	2	4.65
Completed primary education	2	4.65
Incomplete high school	7	16.28
Completed high school	18	41.86
Incomplete higher education	11	25.58
Completed higher education	3	6.98
Total	43	
Salary range (minimum wage)		
<1	2	4.65
1 and 1.5	20	46.51
2 and 2.5	11	25.58
3 or more	9	20.93
Not known	1	2.33
Total	43	
Number of births		
Primiparous	15	34.88
Multiparous	28	65.12
Total	43	
Gestational trimester/week		
1st	7	16.28
2nd	19	44.19
3rd	16	37.21
Not known	1	2.33
Total	43	

to inform about the gestational age of the fetus and did not have a pregnancy record at the time of the interview to collect this information. Finally, only 15 pregnant women (34.88%) were in their first pregnancy; the majority had already had one or more previous pregnancies.

Regarding the comorbidities present in the studied group, 15 pregnant women (34.88%) had some type of comorbidity, with 28 (65.12%) stating that they did not have any health problems associated with pregnancy (Figure 1).

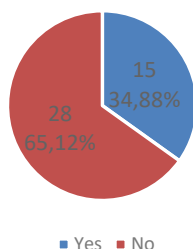


Figure 1. Number of pregnant women participating in the study who had some comorbidity. Yes No in figure – translated text for all figures in red font

With regard to health problems, 15 different types of comorbidities were identified, some resulting from pregnancy and others not. Figure 2 gives the reported comorbidities and their occurrence in each one.

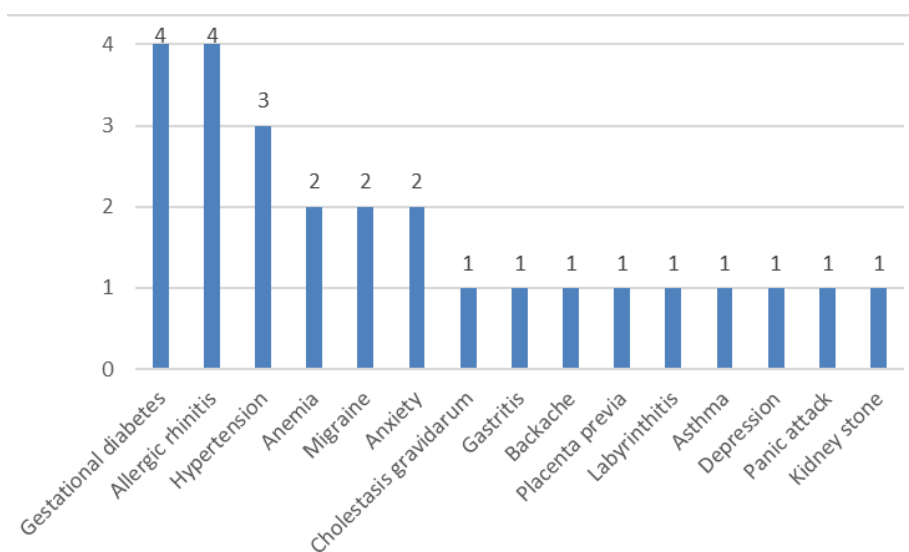


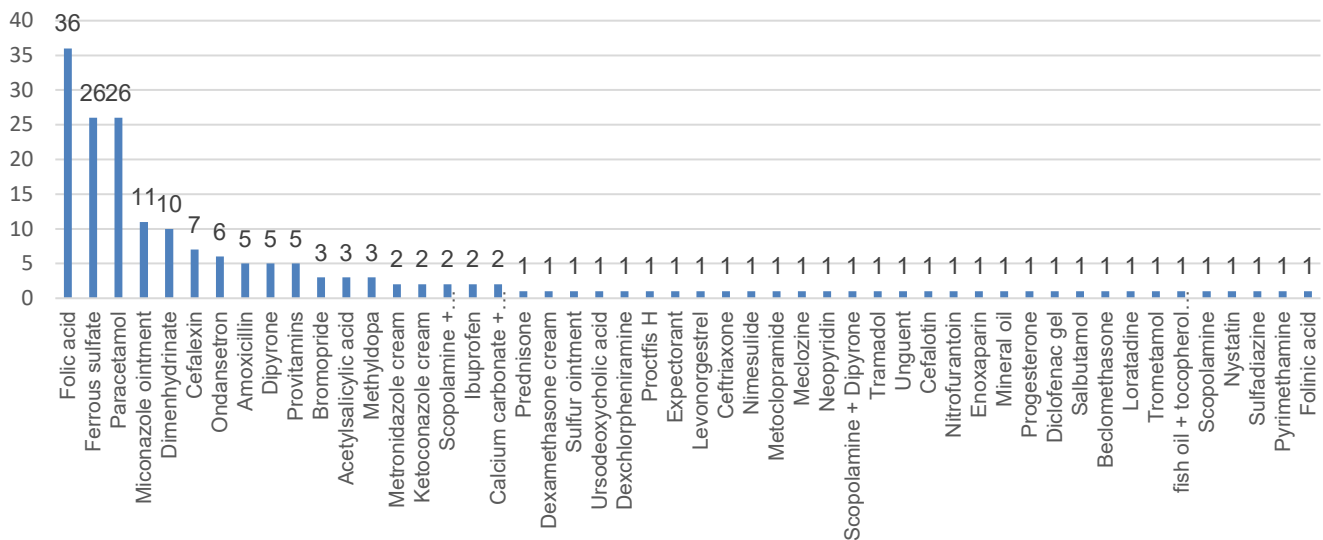
Figure 2. Comorbidities present in study population.

According to Table 2, almost all pregnant women interviewed used some medication during pregnancy (41 [95.35%]). Among these, 40 (97.56%) reported having received a recommendation from a health professional to use the medication, while only one used medication without consulting a qualified professional. It can also be observed that 12 of the pregnant women who received professional guidance alternated use of medications without adequate indication. In total, 13 pregnant women used medications that were not prescribed or recommended by health professionals, of which 11 (26.83%) used self-medication. Overall, the use of 50 different types of drugs was observed, covering different classes (Figure 3).

Among the medicines used, an equal occurrence of risk B and C medicines was found (19 in each category, 42.22%), as shown in Figure 4. Among the medicines analyzed, two could not have their risk assigned (subgallate bismuth, present in Proctfis H® and mineral oil) due to lack of information in databases and leaflets. Only two medications (folic acid and ferrous sulfate) received a type A risk classification. Finally, two medications were classified as risk D (acetylsalicylic acid and dipyrrone) and one medication as risk X (levonorgestrel).

Table 2. Profile of medication and herbal medicine use of pregnant women interviewed.

	n	%
Use of medications		
Yes	41	95.35
No	2	4.65
Total	43	
Use of herbal medicine/medicinal plant		
Yes	13	30.23
No	30	69.77
Total	43	
Prescribed		
Yes	40	97.56
No	1	2.44
Total	41	
By health professional		
Yes	40	97.56
No	1	2.44
Total	41	
Medications prescribed by non-professionals	2	4.88
Self-medication	11	26.83
Total	13	

**Figure 3.** List of medications used and their occurrence in the study population.

In the group of pregnant women who used medicinal plants, 17 different types of plants were observed, listed in Table 3. The table also includes the scientific names of each plant species, as well as the preparation method used according to the research participants. and the pregnancy risk associated with each one.

Among the plant species mentioned (Chart 1), chamomile (*Chamomilla recutita*) was the most used, being reported by four different pregnant women (frequency of 30.77%), while all other species were used

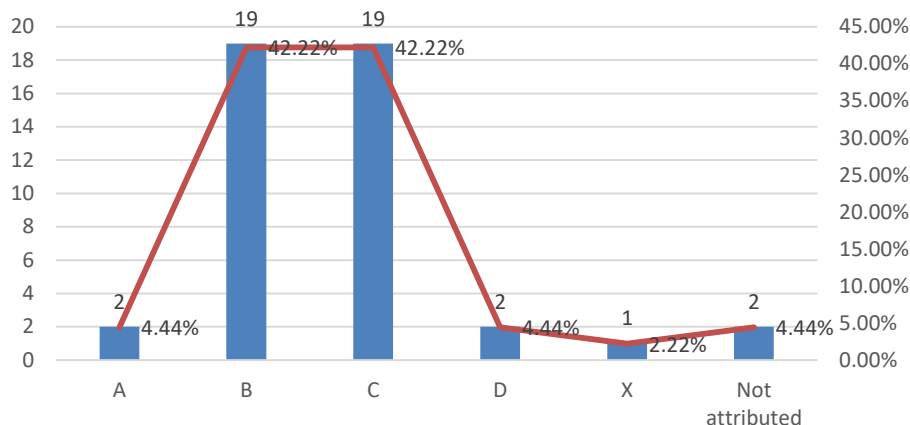


Figure 4. Pregnancy risk category for medications reported by women participating in the study.

Table 3. Medicinal plants reported by the interviewees with their respective scientific names, form of preparation used and pregnancy risk found in the literature.

Plant	Scientific name	Preparation	Pregnancy risk
Rosemary	<i>Rosmarinus officinalis</i>	Tea	Contraindicated
Plum	<i>Prunus domestica</i>	Tea	No report
Eggplant	<i>Solanum melongena</i> L	Water	No report
Beetroot	<i>Beta vulgaris esculenta</i>	Licking	No report
Chamomile	<i>Chamomilla recutita</i>	Tea	Contraindicated
Cinnamon	<i>Cinnamomum cassia</i>	Tea	Contraindicated
Lemongrass	<i>Cymbopogon citratus</i>	Tea	Contraindicated
Tea tree	<i>Camellia sinensis</i>	Tea	Contraindicated
Shell ginger	<i>Alpinia zerumbet</i>	Tea	No report
Bushy matgrass	<i>Lippia alba</i>	Tea	No report
Anise	<i>Pimpinella anisum</i>	Tea	Contraindicated
Eucalyptus	<i>Eucalyptus globulus</i> Labill.	Inhalation	No report
Sesame	<i>Sesamum orientale</i>	Tea	No report
Janauba	<i>Himatanthus drasticus</i>	Tea	No report
Passion flower	<i>Passiflora edulis</i>	Tea	Contraindicated
Stonebreaker	<i>Phyllanthus niruri</i>	Tea	Contraindicated
Ginger	<i>Zingiber officinale</i>	Juice	Indicated with reservations

Chart 1. Form of preparation reported by interviewees for the use of medicinal herbs.

	N	%
Tea	13	76.47
Water	1	5.88
Licking	1	5.88
Inhalation	1	5.88
Juice	1	5.88
Total	17	

by only one interviewee each (data not given in the table). It was noted that some pregnant women used more than one plant during pregnancy.

Among the plants mentioned (Chart 1), 13 (76.47%) were used in the form of tea, so only eggplant (*Solanum melongena* L.), beetroot (*Beta vulgaris esculenta*), eucalyptus (*Eucalyptus globulus* Labill.) and ginger (*Zingiber officinale*) were prepared in another way.

According to Chart 2, eight (47.06%) of the plants used by pregnant women are contraindicated during pregnancy.¹⁶⁻¹⁸ For the others, 8 (47.06%) have no reports in the literature about their pregnancy risk in humans. Ginger (*Zingiber officinale*) is the only reported plant that can be indicated during pregnancy, although with reservations regarding the daily amount ingested, with studies proving its safety in doses of 200 to 500 mg daily.¹⁹

Chart 2. Frequency of indication and contraindication of medicinal herbs reported in this study.

	N	%
Indicated with reservations	1	5.88
Contraindicated	8	47.06
No report	8	47.06
Total	17	

DISCUSSION

Other studies did not divide the age groups of the participants using the MS risk criteria, but they corroborate the data found, as they show participants between 18 and 35 years old. Santos et al.,⁵ in a study published in 2018, carried out in a polyclinic in Quixadá (CE) with 80 high-risk pregnant women treated by SUS, found an age prevalence between 28 and 32 years (37.24%); Kassada et al.,²⁰ in Maringá (PR), with a sample of 394 pregnant women who received prenatal care at UBSs, revealed a predominant range of 19 to 30 years of age (61.17%).

As for other sociodemographic factors, 56.25% of the participants in the study by Santos et al.⁵ had completed high school, and 65% of them had an income of 1 to 2 minimum wages; 93.75% of pregnant women had a partner (married or in a formal union), with 43% being in the 3rd trimester of pregnancy at the time of the survey. In their study on pregnant women, Kassada et al.²⁰ observed the following: 67.51% had more than nine years of study (ranging from the beginning of high school to higher education), 77.15% had partners, with the majority having an income of 2 to 3 (62.69%) and more than half were in the 2nd trimester of pregnancy, with 55.84% of participants in this range. It can be observed that the data were found paired, with divergence only between the average income in the study by Kassada et al.²⁰ and in relation to the gestational trimester observed in Santos et al.⁵

The similarity in income between this study and that of Santos et al.⁵ and the dissimilarity compared to Kassada et al.²⁰ can be explained by the difference in the Human Development Index (HDI) between the states where the studies were carried out: the first two were carried out in Ceará, with an income HDI of 0.676 in 2017, while the last one was carried out in Paraná, which has an income HDI of 0.771, the 5th highest in the country, in the same year.²¹ Regarding gestational age, the divergence may be due to the fact that the research in Santa Catarina was collected in a UBS, in the same way as the present study, while the collection by Santos et al.⁵ was carried out in a polyclinic, which configures a more specialized level of care.

Costa et al.,²² in their study carried out in a municipality of Recôncavo Baiano, Santo Antônio de Jesus, reported that 50.2% of the 1,091 patients who participated had some type of comorbidity, while Kassada et al.²⁰ described a percentage of 39% of pregnant women. There is a greater difference in results found between the present study and the one carried out in Bahia, but close to the value found by Kassada et al.²⁰ This greater distance in relation to the first work and proximity to the second, may be due to the sample size of each of the studies, with the number of pregnant women present in the population studied in Maringá (PR) being closer to that in our study, held in Sobral.

Among the most reported comorbidities, the most prevalent were gestational diabetes mellitus (GDM) and allergic rhinitis, both with 15.38% prevalence, followed by Hypertension (chronic or gestational associated) with 11.54%. Luz et al.²³ studied 52 women undergoing high-risk prenatal care at a polyclinic in the city of Divinópolis (MG), and they found similar results, where 23.1% of the patients had GDM and 21.2% pre-eclampsia, a condition associated with hypertension during pregnancy.

It is possible to note that practically all pregnant women used some medication during pregnancy, and the only two interviewees who answered no to the question were in their first prenatal consultation at the time of the interview. Therefore, the factor associated with the use or not of medication during the period is possibly related to the beginning of prenatal care. Lounardi-Maia et al.²⁴ conducted a study with 212 pregnant women that included an evaluation of their use of medication before and after confirmation of pregnancy. The authors found that 97.6% of those interviewed began using some medication after starting prenatal care, while less than half of the women (46.7%) stated that they used some medication before pregnancy diagnosis, supporting the hypothesis that the beginning of prenatal care is related to the use of medication during pregnancy.

This is in accordance with the protocol of Ceará Birth Care Conduct,²⁵ launched by the Ceará State Health Department, which recommends the prescription of folic acid 0.4 mg/day during the 1st trimester of pregnancy, in addition to iron supplementation from the 2nd trimester onwards, a practice also present in the Pre-Natal Care protocol of the Municipality of Sobral.

Regarding the use of medicines recommended by a health professional, we found here a higher value than that reported in Santo Antônio de Jesus, in Bahia, which reported a rate of 91.3% of use of medicines prescribed by doctors and nurses. However, we observed a higher self-medication rate, 26.83%, in relation to the aforementioned study, which had 13% self-medication.²² It is worth mentioning that in the present study the self-medication rate refers to both the use of marketed medicines (synthetic and herbal) and medicinal plants. Among the health professionals mentioned by the patients, doctors and nurses were reported as prescribers, and nutritionists recommended some of the plant species.

Regarding the use of herbal medicines or medicinal plants during pregnancy, it was higher than that found in a health center in Montes Claros (MG) (10.8% only reported the use of medicinal plants),²⁶ but lower than that found by Santos et al.⁵ in Quixadá (CE), in which 70% of pregnant women used this type of therapy. According to Cardoso and Amaral,²⁷ in an integrative review carried out with 46 articles, involving studies representing all continents, the prevalence of the use of medicinal plants and herbal medicines during pregnancy varied between 3.9 and 67.5%, which results in a global average of 32.11%, a value close to that observed in our study, 30.26%.

The value found for the use of anti-anemic drugs (83.72% for folic acid and 60.47% for ferrous sulfate, used by 36 and 26 pregnant women, respectively) was higher than that found in other studies with values ranging from 71.2 to 37.2%.^{5,20,22,24} It is possible to note the assiduity of professionals at the health

unit in following the protocol established by the Ceará State Health Department, mentioned above, and a good adherence of pregnant women to the medications prescribed at the beginning of prenatal care, explaining their higher use in such a unit.

Paracetamol was used by 26 pregnant women, vaginal miconazole ointment by 11 and dimenhydrinate by 10 patients. With the exception of miconazole, the other two are also among the groups of medications most used during pregnancy in other studies, but again in a lower percentage than that observed in this study.^{5,20,22}

Regarding the use of miconazole with a high frequency, in relation to other medications, it can be explained by the changes that occur in the flow and in the vaginal microbiota of the pregnant woman. Although the use of vaginal antifungals is not the first alternative protocol approach in Ceará,²⁵ it is observed that there is still a high number of prescriptions, possibly due to the recent change in protocol and associated cultural factors.

Except for medications classified as risk A, which showed a lower frequency compared to other studies, the other risk classes were observed with a prevalence equivalent to that in the literature.^{5,7,20,28} This may be due to the possibility that new studies have changed the risk classification of medications over the years, as can be seen with ondansetron, previously classified as risk B during pregnancy, but since 2019 it has been contraindicated by ANVISA, which reclassified it as risk D, based on evidence that demonstrated that the drug may be related to defects in orofacial closures.²⁹ As there has not yet been an official change in classification, it was decided to classify ondansetron as risk B in this study, according to its leaflet.

The prevalence of risk B and C medications may be associated with the exclusion of these patients from clinical drug development trials, as there are generally no data from clinical research on the risks they may pose to pregnancy and the growing embryo or fetus.³⁰

Acetylsalicylic acid and dipyron were the only two medications in category D. This risk is associated with the inhibition of prostaglandin synthesis by non-steroidal anti-inflammatory drugs (NSAIDs), being more important in the 3rd trimester of pregnancy, contraindicating the use of this class of medications during pregnancy.³¹ Except for these two representatives of the class, it is observed that the other NSAIDs are in risk classification C.

The only drug with gestational risk X was levonorgestrel, used as an oral contraceptive, especially as an emergency contraceptive method.^{32,33} The use of this type of medication during pregnancy can occur when the patient uses it in an attempt to avoid an unwanted pregnancy and contraception fails. Levonorgestrel is classified as risk X in its leaflet. However, there are studies that indicate its safety in case of contraception failure, without causing risks of fetal malformations or damage to neural or motor development.³⁴

Two medications do not have a risk classification during pregnancy, bismuth subgallate and mineral oil. The lack of classification may be due both to the lack of studies on the risks of these medications to pregnancy in humans and animals, and to the fact that the FDA no longer uses this risk classification system, currently using summaries of articles and scientific evidence in medication leaflets themselves.⁹ However, the classification created in 1979 continues to be the way in which the gestational risks of medications are still expressed in scientific articles and medication leaflets in Brazil.

The higher prevalence of chamomile use during pregnancy is in line with studies carried out in other parts of the world, as shown in the integrative review by Cardoso and Amaral.²⁷ It is also possible to observe that the continent with the highest prevalence of use of this plant is America, followed by Europe.

It is noted that the most common way of using plants was through tea. Colet et al.³⁵ in the municipality of Ijuí, in Rio Grande do Sul, found that 81% of 446 SUS users interviewed used medicinal plants in the form of tea. In São Luís (MA), it was observed that most of the use of medicinal plants is through tea made by decoction or maceration³⁶ and in Teresina (PI), Rodrigues et al.³⁷ described a 40% prevalence of tea use in a survey carried out with a sample of 50 people from different neighborhoods in the city. As tea is the most common form of use of medicinal plants in the population, it is expected that the same usage profile will be reproduced among the pregnant women interviewed. The present study did not set out to verify how the preparation was carried out or whether it was the most appropriate for the plant species and the part of the plant used.

We noted a high rate of use of medicinal plants not recommended during pregnancy by patients, followed by plants that have no reports on their toxicity during pregnancy. The indiscriminate use of plants is present in other studies that measure their use during pregnancy, in which there is a high number of pregnant women who use plant species with reports of teratogenic and abortifacient effects in the literature. A high rate of chamomile use was described, a plant that has consistent literature regarding its contraindication during pregnancy.^{5,27,38,39}

We can highlight that despite the widespread use of medicinal plants, especially in countries like Brazil, there are few or no studies on their effects on pregnant patients, considering that for almost half of the plants mentioned, no reports were found in the literature about the existence of any contraindication. In cases such as plum (*Prunus domestica*) and lemongrass (*Lippia alba*), there is only the presence of animal studies, which reported possible positive effects on pregnancy: plum had an effect on osteogenesis in the rat fetus, increasing bone growth rate in relation to the control group;⁴⁰ lemongrass showed myorelaxant activity in myometrial tissue, and may have some tocolytic activity, that is, prevention of premature birth.⁴¹ However, there are no reports of such activities in human patients, no and can be extrapolated to such a group.

Ginger (*Zingiber officinale*) was the only plant used by the interviewees that is indicated during pregnancy. In contrast to this study, in which only one interviewee reported its use, it appears as one of the main medicinal plants used by pregnant women in other studies.^{27,38} This species is indicated for nausea and vomiting, conditions common to the first trimester of pregnancy, with an efficacy equivalent to other drugs, such as metoclopramide, but it has not demonstrated the ability to reduce episodes, which may become recurrent.^{19,38}

Another worrying factor is the quality control of the plant species used. Souza Maria et al.,¹¹ in a study with plants collected in different locations and from different suppliers in São Paulo, demonstrated that there is no standardization or strict control of the products sold, so the consumer ends up having access to a low-quality product, which may pose some health risk. Furthermore, it is common to use home-grown plants, which also do not have adequate collection or control.³⁷

Furthermore, one must consider the fact that some pregnant women report having received recommendations from health professionals for the use of plants that are not recommended during pregnancy or that there are no studies that corroborate their use for pregnant patients. Studies indicate that the healthcare team, in general, does not have sufficient knowledge about phytotherapy and medicinal plants or about the national policies that regulate this type of input. Despite this, health professionals consider the use of medicines of plant origin to be important and that the team must have knowledge about them, recognizing such a lack in their education and performance.^{42,43}

Therefore, it is necessary both for educational institutions to observe this need in the training of undergraduates, and for managers to offer training and continuing education for professionals and promote the full implementation of policies aimed at the use of medicinal plants and herbal medicines in primary care.^{42,43}

It is noted that no pregnant woman reported having received a recommendation from a pharmaceutical professional at the time of the research. The pharmacist is the only healthcare professional who has subjects focusing on phytotherapy and medicinal plants as a mandatory part of their curriculum,⁴⁴ so their absence in healthcare unit teams and prenatal care can impact this use. of plants contraindicated by the participants. Although Pharmaceutical Care is supported by specific policies, it is observed that its institutionalization in primary care is still low, which makes it difficult for the pharmacist to work both in monitoring patients and in integrating with the family health team.⁴⁵

Within primary care, the pharmacist can carry out pharmacotherapeutic monitoring with the user, resulting in greater effectiveness of drug therapy and reducing the risks inherent to it, in addition to promoting health education with professionals and patients. Thus, the addition of this professional to the multidisciplinary team guarantees comprehensive care for the population.⁴⁵

It is observed that pharmacist monitoring of patients with high-risk pregnancies (GDM and pre-eclampsia) is capable of ensuring better adherence to drug therapy, promoting the Rational Use of Medicines and increasing the patients' quality of life.^{46,47} Therefore, it appears that the presence of a pharmacist during prenatal care can help to improve the prognosis and achieve therapeutic goals for such patients.

CONCLUSION

Among the population studied, the majority of participants had a steady partner, previous pregnancy experience and some level of formal education. There was a high incidence of medication use by pregnant women, which is associated with prenatal monitoring protocols. The interviewees avoided using medications not recommended by appropriate professionals but demonstrated an indiscriminate use of herbal medicines and medicinal plants. A high rate of B and C risk medications was identified, highlighting the need to carry out more studies in this group of patients, which is also valid for plant species. The absence of a pharmacist in the health team and in prenatal guidance may be a relevant factor for this profile of use of medicines and medicinal plants, given their importance in promoting the Rational Use of Medicines, which can expose these patients to risks avoidable. Therefore, it is necessary to conduct more studies to observe the impact of medication use by pregnant women and how monitoring by a pharmacist can contribute to the prevention and reduction of these risks.

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CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

JO: Project administration, Formal analysis, Conceptualization, Data curation, Writing – original draft, Writing – review & editing, Research, Methodology, Software. TM: Project administration, Formal analysis, Data curation, Writing – review & editing, Methodology, Supervision, Validation, Visualization. DPM: Project administration, Conceptualization, Writing – original draft, Supervision. METC: Writing – review & editing, Methodology, Supervision, Validation, Visualization. AEF: Formal analysis, Writing – original draft.

REFERENCES

- Hall JE. Tratado de fisiologia médica. 13ª ed. Rio de Janeiro: Elsevier; 2017
- Nascimento AM, Gonçalves RELM, Medeiros RMK, Lisboa HCF. Avaliação do uso de medicamentos por gestantes em Unidades Básicas de Saúde de Rondonópolis, Mato Grosso. *Revista Eletrônica Gestão & Saúde* 2016;7(1): 96-112.
- Santos PO, Alencar TOS, Alencar BR. Medicamentos e gravidez: uma análise dos estudos de utilização de medicamentos realizados no Brasil (2000–2011). *Revista Eletrônica Gestão & Saúde* 2013;4(3):1102-15.
- Rocha RS, Bezerra SC, Lima JWO, Costa FS. Consumo de medicamentos, álcool e fumo na gestação e avaliação dos riscos teratogênicos. *Rev Gaúcha Enferm* 2013;34(2):37-45. <https://doi.org/10.1590/S1983-14472013000200005>
- Santos SLF, Alves HHS, Pessoa CV, Arraes MLBM, Barros KBNT. Automedicação em gestantes de alto risco: foco em atenção farmacêutica. *Rev Med UFC* 2018;58(3):36-43. <https://doi.org/10.20513/2447-6595.2018v58n3p36-43>
- Varallo FR, Mastroianni P. Farmacovigilância: avaliação do risco/benefício para a promoção do uso seguro de medicamentos. Porto Alegre: Artmed; 2013.
- Richter FM, Rigo MPM, Castro LC, Kauffmann C, Ely LS. Utilização de medicamentos por gestantes usuárias do Sistema Único de Saúde em um município do Vale do Taquari – RS. *Revista Destaques Acadêmicos* 2016;8(3):7-19. <http://dx.doi.org/10.22410/issn.2176-3070.v8i3a2016.1052>
- Silveira PF, Bandeira MAM, Arrais PSD. Farmacovigilância e reações adversas às plantas medicinais e fitoterápicos: uma realidade. *Rev Bras Farmacogn* 2008;18(4):618-26. <https://doi.org/10.1590/S0102-695X2008000400021>
- Rocha R, Rennó Jr J, Ribeiro HL, Cavalsan JP, Cantilino A, Ribeiro JAM, et al. Medicamentos na gravidez e na lactação: novas normas da FDA. *Revista Debates em Psiquiatria* 2015;5:28-32.
- Brasil. Agência Nacional de Vigilância Sanitária. Legislação [Internet]. [accessed on Sep 18, 2018]. Available at: <http://antigo.anvisa.gov.br/legislacao#/visualizar/27194>
- Souza Maria NCV, Tangerina MMP, Silva VC, Vilegas W, Sannomiya M. Plantas medicinais abortivas utilizadas por mulheres de UBS: etnofarmacologia e análises cromatográficas por CCD e CLAE. *Rev Bras Plantas Med* 2013;15(4 suppl 1):763-73. <http://dx.doi.org/10.1590/s1516-05722013000500018>
- Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução – RDC nº 18, de 3 de abril de 2013. Dispõe sobre as boas práticas de processamento e armazenamento de plantas medicinais, preparação e dispensação de produtos magistrais e oficinais de plantas medicinais e fitoterápicos em farmácias vivas no âmbito do Sistema Único de Saúde (SUS) [Internet]. 2013 [accessed on Sep 18, 2018]. Available at: http://bvsmms.saude.gov.br/bvs/saudelegis/anvisa/2013/rdc0018_03_04_2013.html
- Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução da Diretoria Colegiada – RDC nº 26 de 13 maio de 2014. Dispõe sobre o registro de medicamentos fitoterápicos e o registro e a notificação de produtos tradicionais fitoterápicos [Internet]. 2014 [accessed on Sep 18, 2018]. Available at: http://bvsmms.saude.gov.br/bvs/saudelegis/anvisa/2014/rdc0026_13_05_2014.pdf
- Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012. Diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos [Internet]. *Diário Oficial da União da República Federativa do Brasil*; 2013 [accessed on Oct 10, 2018]. Available at: http://bvsmms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html
- Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Gestação de alto risco: manual técnico. 5ª ed. [Internet]. Brasília: Editora do Ministério da Saúde; 2010 [accessed on Feb 13, 2020]. Available at: https://bvsmms.saude.gov.br/bvs/publicacoes/gestacao_alto_risco.pdf
- Grandi TSM. Tratado das plantas medicinais. Belo Horizonte: Adequatio Estúdio; 2014.
- Matos FJA. Plantas medicinais: guia de seleção e emprego de plantas usadas em fitoterapia no Nordeste do Brasil. 3ª ed. Fortaleza: UFC Edições; 2007.
- Rossato AE. Fitoterapia racional: aspectos taxonômicos, agroecológicos, etnobotânicos e terapêuticos. Florianópolis: DIOESC; 2012.
- Duarte AFS, Martins ALC, Miguel MD, Miguel OG. O uso de plantas medicinais durante a gravidez e amamentação. *Visão Acadêmica* 2017;18(4):126-39. <http://dx.doi.org/10.5380/acd.v18i4.55983>
- Kassada DS, Miasso AI, Waidman MAP, Marcon SS. Prevalence and factors associated with drug use in pregnant women assisted in primary care. *Texto Contexto – Enferm* 2015;24(3):713-21. <https://doi.org/10.1590/0104-07072015002770013>

21. Instituto de Pesquisa Econômica Aplicada. Radar IDHM. Evolução do IDHM e de seus índices componentes no período de 2012 a 2017 [Internet]. Brasília: IPEA; 2019 [accessed on Feb 11, 2020]. Available at: http://www.atlasbrasil.org.br/2013/data/rawData/Radar%20IDHM%20PNADC_2019_Book.pdf
22. Costa DB, Coelho HLL, Santos DB. Utilização de medicamentos antes e durante a gestação: prevalência e fatores associados. *Cad Saúde Pública* 2017;33(2):e00126215. <https://doi.org/10.1590/0102-311X00126215>
23. Luz BG, Soares LT, Grillo VTRS, Viola BM, Laporte IC, Bino DBM, et al. O perfil das gestantes de alto risco acompanhadas no pré-natal da policlínica de Divinópolis-MG, no biênio 2013/14. *J Health Biol Sci* 2015;3(3):137-43. <https://doi.org/10.12662/2317-3076jhbs.v3i3.177.p137-143.2015>
24. Lunardi-Maia T, Schuelter-Trevisol F, Galato D. Uso de medicamentos no primeiro trimestre de gravidez: avaliação da segurança dos medicamentos e uso de ácido fólico e sulfato ferroso. *Rev Bras Ginecol Obstet* 2014;36(12):541-7. <https://doi.org/10.1590/so100-720320140005051>
25. Sousa LAR, org. Nascer no Ceará: condutas assistenciais para a linha de cuidado materno-infantil do estado do Ceará. Fortaleza: Littere; 2018
26. Silva PLN, Oliveira JS, Santos APO, Vaz MDT. Cuidados pré-natais e puerperais às gestantes de um centro de saúde de Minas Gerais quanto ao risco de pré-eclâmpsia: aspectos clínicos, nutricionais e terapêuticos. *J Health Biol Sci* 2017;5(4):346-51. <http://dx.doi.org/10.12662/2317-3076jhbs.v5i4.1222.p346-351.2017>
27. Cardoso BS, Amaral VCS. O uso da fitoterapia durante a gestação: um panorama global. *Ciênc Saúde Colet* 2019;24(4):1439-50. <https://doi.org/10.1590/1413-81232018244.07472017>
28. Segura FAK, Costa da Fonseca MRC. Utilização de medicamentos durante a gravidez: um estudo de revisão. *Saúde-UNG* 2015;9(1-2):85-95.
29. Brasil. Agência Nacional de Vigilância Sanitária. Agerência de farmacovigilância alerta para o risco de ocorrência de malformações congênitas com o uso do medicamento ondansetrona [Internet]. 2019 [accessed on Feb 13, 2020]. Available at: http://antigo.anvisa.gov.br/informacoes-tecnicas13?p_p_id=101_INSTANCE_R6VaZWsQDDzS&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&_101_INSTANCE_R6VaZWsQDDzS_groupId=33868&_101_INSTANCE_R6VaZWsQDDzS_urlTitle=a-gerencia-de-farmacovigilancia-alerta-para-o-risco-de-ocorrencia-de-malformacoes-congenitas-com-o-uso-do-medicamento-ondansetrona-&_101_INSTANCE_R6VaZWsQDDzS_struts_action=%2Fasset_publisher%2Fview_content&_101_INSTANCE_R6VaZWsQDDzS_assetEntryId=5650099&_101_INSTANCE_R6VaZWsQDDzS_type=content
30. Kaye DK. The moral imperative to approve pregnant women's participation in randomized clinical trials for pregnancy and newborn complications. *Philos Ethics Humanit Med* 2019;14(1):11. <https://doi.org/10.1186/s13010-019-0081-8>
31. Drugs.com. Aspirin pregnancy and breastfeeding warnings [Internet]. 2018 [accessed on Feb 12, 2020]. Available at: <https://www.drugs.com/pregnancy/aspirin.html>
32. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Anticoncepção de emergência: perguntas e respostas para profissionais de saúde. 2ª ed. Brasília: Editora do Ministério da Saúde; 2011.
33. World Health Organization. Emergency contraception [Internet]. 2018 [accessed on Feb 13, 2020]. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/emergency-contraception>
34. Zhang L, Ye W, Yu W, Cheng L, Shen L, Yang Z. Physical and mental development of children after levonorgestrel emergency contraception exposure: a follow-up prospective cohort study. *Biol Reprod* 2014;91(1):27. <https://doi.org/10.1095/biolreprod.113.117226>
35. Colet CF, Cavaleiro CAN, Dal Molin GT, Cavinatto AW, Schiavo M, Schwambach KH, et al. Uso de plantas medicinais por usuários do serviço público de saúde do município de Ijuí/RS. *Rev Bras Med Fam Comunidade* 2015;10(36):1-13. [http://dx.doi.org/10.5712/rbmf10\(36\)930](http://dx.doi.org/10.5712/rbmf10(36)930)
36. Cunha MMC, Dondim RSD, Bonfim BF, Batalha Júnior NJP, Barroso WA, Vilanova CM. Perfil etnobotânico de plantas medicinais comercializadas em São Luís, Maranhão, Brasil. *Scientia Plena* 2015;11(12):121202. <http://dx.doi.org/10.14808/sci.plena.2015.121202>
37. Rodrigues KA, Oliveira LS, Raimundo Neto F, Araújo MP, Gomes DCV. O uso de plantas medicinais pela comunidade da zona norte de Teresina – PI e seus fins terapêuticos. *R Interd* 2017;10(4):74-81.
38. Ahmed SM, Nordeng H, Sundby J, Aragaw YA, de Boer HJ. The use of medicinal plants by pregnant women in Africa: a systematic review. *J Ethnopharmacol* 2018;224:297-313. <https://doi.org/10.1016/j.jep.2018.05.032>
39. Gorriil LE, Jacomassi E, Mella Junior SE, Dalsenter PR, Gasparotto Junior A, Lourenço ELB. Risco das plantas medicinais na gestação: uma revisão dos dados de acesso livre em língua portuguesa. *Arq Ciênc Saúde UNIPAR* 2016;20(1):67-72. <http://dx.doi.org/10.25110/arqsaude.v20i1.2016.5515>
40. Monsefi M, Parvin F, Farzaneh M. Effects of plum extract on skeletal system of fetal and newborn mice. *Med Princ Pract* 2013;22(4):351-6. <https://doi.org/10.1159/000346625>
41. Pereira-de-Morais L, Silva AA, Silva RER, Costa RHS, Monteiro AB, Barbosa CRS et al. Tocolytic activity of the *Lippia alba* essential oil and its major constituents, citral and limonene, on the isolated uterus of rats. *Chem Biol Interact* 2019;297:155-9. <https://doi.org/10.1016/j.cbi.2018.11.006>
42. Mattos G, Camargo A, Sousa CA, Zeni ALB. Plantas medicinais e fitoterápicos na Atenção Primária em Saúde: percepção dos profissionais. *Ciênc Saúde Colet* 2018;23(11):3735-44. <https://doi.org/10.1590/1413-812320182311.23572016>
43. Nascimento Júnior BJ, Tínel LO, Silva ES, Rodrigues LA, Freitas TON, Nunes XP, et al. Avaliação do conhecimento e percepção dos profissionais da estratégia de saúde da família sobre o uso de plantas medicinais e fitoterapia em Petrolina-PE, Brasil. *Rev Bras Plantas Med* 2016;18(1):57-66. https://doi.org/10.1590/1983-084X/15_031

44. Rates SMK. Plantas medicinais e fitoterápicos na prática farmacêutica. In: Pereira LRL, Farias MR, Castro MS, orgs. Associação Brasileira de Ciências Farmacêuticas; PROFARMA Programa de Atualização em Ciências Farmacêuticas: da Assistência Farmacêutica à Farmácia Clínica. Porto Alegre: Artmed Panamericana; 2019. p. 131-77.
45. Araújo PS, Costa EA, Guerra Junior AA, Acurcio FA, Guibu IA, Álvares J, et al. Atividades farmacêuticas de natureza clínica na atenção básica no Brasil. *Rev Saúde Pública* 207;51 Supl 2:6s. <https://doi.org/10.11606/S1518-8787.2017051007109>
46. Costa Júnior GL, Trevisan M. Gestantes com diabetes: o papel do farmacêutico no acompanhamento farmacológico. *Rev Artigos.Com* 2021;30:e7581
47. Sousa VP, Franqueiro EPM, Bragança C, Mendonça GS. Atenção farmacêutica à gestantes portadoras de pré-eclâmpsia. *Rev Saúde.Com* 2021;17(4):2444-51. <https://doi.org/10.22481/rsc.v17i4.4935>