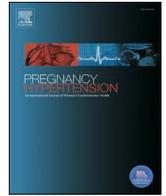




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Postpartum care after preeclampsia: Lack of knowledge and inadequate counseling on long-term consequences

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ABSTRACT

Background: Preeclampsia has long-term consequences, with an increased risk of cardiovascular disease.

Objective

To assess women's knowledge about preeclampsia (PE) and to what extent the postpartum healthcare provided was aligned with evidence-based guidelines.

Methods

A cross-sectional study conducted between 2021 and 2022, in two referral maternity hospitals in southeast Brazil. Women diagnosed with PE in the current pregnancy were contacted by weeks after childbirth and interviewed about the length of hospital stay, use of antihypertensive drugs, scheduled visits, place of care, professionals involved in postpartum care, blood pressure monitoring and knowledge about PE. A descriptive analysis was conducted.

Results

One hundred and twenty-four women with PE were invited to the study, and 100 answered the questionnaire six weeks postpartum, with a response rate of 80 %. Most women were young (aged 20–34 years), predominantly white, multiparous, and had underlying medical conditions. Route of delivery was predominantly cesarean section (75 %), with a high preterm birth rate (75 %). Half of hospital stays lasted 3–5 days. All women were referred to primary care and 49 % had a scheduled visit recommended during the first week postpartum. Around one-third of the women were not using antihypertensive medication 6 weeks postpartum. Main counselling received: maintenance of blood pressure measurements (65 %), management of medications (53 %), follow-up visits (41 %) and lifestyle changes were encouraged (35 %). However, 98 % of the women were unaware of the long-term repercussions of PE and only 35 % felt supported during postpartum medical care.

Conclusion

Early return to specialized care was lacking and guidance on the long-term risks after preeclampsia was inadequate.

1. Introduction

Pregnancy-related hypertensive disorders represent an important public health concern worldwide [1]. Along with hemorrhage and infection, hypertensive disorders form the still known “cursed triad in Obstetrics” [2–4]. According to the World Health Organization data, although preeclampsia (PE) and eclampsia account for approximately 10 to 15 % of maternal deaths worldwide, 99 % of these deaths are

concentrated in low- and middle-income settings, such as Brazil. PE is the leading cause of maternal mortality and is responsible for a quarter of all deaths identified in Brazil [5–8]. Severe morbidities related to PE that may potentially cause maternal death, include renal failure, cerebrovascular events, cardiac insufficiency, acute pulmonary edema, coagulopathy and liver failure [9–15].

Concerning long-term complications in these patients, it is known that PE and gestational hypertension can increase the odds of

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developing chronic arterial hypertension by up to 25–45 % in the first five years postpartum and promote a 2–8-fold increased lifetime risk [16–21]. In a similar manner, a twofold increase in cardiovascular disease occurs when there is a history of PE, predisposing the patient to thromboembolic events, vascular disease and death from cardiovascular disorder [24–27]. Microalbuminuria associated with initial renal injury is considered an early marker of cardiovascular risk, and is a more frequent finding in women with a history of PE. There is a 4-fold risk of microalbuminuria in those women compared to normotensive women, even more than 7 years after childbirth [28,29]. Furthermore, an increased risk of progression to end-stage renal disease occurs in women with PE and gestational hypertension, especially in those with a history of disorder recurrence [21,30,31]. In addition to cardiovascular and renal complications, women with a history of gestational hypertensive disorders may have metabolic repercussions, e.g., a high incidence of dyslipidemia [21]. There is also about a two-fold increased risk of developing diabetes mellitus in the future. This risk is evidenced in the first year of follow-up and continues for more than 10 years [21,32].

The American College of Obstetricians and Gynecologists (ACOG) and the American Heart Association (AHA) emphasize the commitment of the obstetrician-gynecologist in the postpartum care transition. The obstetrician/gynecologist is responsible for counseling on cardiovascular and metabolic risk, disease screening, and patient referral for specialist evaluation. This is a unique chance to continue education and intervention in modifiable risk factors for a reduction in the morbidity and mortality of these women in the long term [22,23]. Guidelines from around the world, such as the protocol of the Brazilian Network of Studies on Hypertension in Pregnancy (RBEHG), recommend that postpartum patients should be informed about the high possibility of developing long-term adverse cardiovascular events, ensuring a window of opportunity to seek preventive care. Therefore, counseling on health disciplines, screening for early cardiovascular disease and referral for specialized care, if necessary, are essential [33–35].

As described in the national protocol, the follow-up of PE patients without signs of severity usually occurs in primary care facilities. In severe cases, it should take place in secondary or tertiary healthcare units [18].

During follow-up visits, a healthy lifestyle is recommended. The goals are reevaluation of arterial blood pressure, adjustment of antihypertensive drugs and control of modifiable cardiovascular risk factors. Physical activity and healthy eating habits are encouraged. Furthermore, annual monitoring of laboratory tests, including renal function, urinalysis, lipid profile and blood glucose level should be performed and extended for at least 5 years. Patients should be advised about contraception and the risks associated with a new pregnancy. [21,33,36–38].

PE has a significant impact worldwide, with high rates of maternal and perinatal morbidity and mortality, in addition to an increased risk for short- and long-term postpartum complications. Consequently, the aim of this study was to investigate women's knowledge about preeclampsia, and assess whether patient care complied with clinical practice guidelines.

2. Methods

This cross-sectional pilot study was conducted between August 2021 and July 2022. Study approval was obtained from the Research Ethics Committee, under number CAAE 44581421.0.0000.5373. All participants signed an Informed Consent Form prior to data collection. The study was carried out in the maternity hospitals of Santa Lucinda Hospital (birth rate: around 140 per month) and Sorocaba Hospital Group (birth rate around: 250 per month), which are linked to the PUC-SP Medical School, in Southeast Brazil. These maternity hospitals are responsible for the public healthcare of high- and low-risk pregnant women in 48 municipalities of the Sorocaba Regional Health Department.

Sample size was not calculated. The first 125 consecutive women

diagnosed with preeclampsia at the participating maternity hospitals during the study period, were included. All women had received a previous diagnosis of PE, according to criteria established by ACOG and the Brazilian Network for Studies on Hypertension in Pregnancy (RBEHG).

At the time of hospital admission for childbirth or treatment in a high-risk ward, women were identified by medical record review (to ascertain PE diagnosis). Afterwards, the research assistant invited them to voluntarily participate in proposed postpartum interviews and obtained written informed consent for the study. All interviews were carried out by the same research assistant.

In the initial approach, the research assistant asked participants about their sociodemographic characteristics and informed these women that a subsequent phone call at 6 weeks postpartum would be required to conclude the interview. The research assistant collected all possible contact phone numbers during patient inclusion and patients chose the best time to be contacted for the interview.

Sociodemographic characteristics included age (in full years at the time of study enrollment) and self-identified skin color (categorized as white or non-white). In Brazil, the Brazilian Institute of Geography and Statistics (IBGE) classifies skin color into categories, based on self-identification of the population: white, black, pardo (brown or mixed-race), yellow (East Asian), or South American indigenous. The Brazilian population is unique in its diverse racial mixture and demographics. As a result, this study simplified the variable into two categories: white and non-white [39].

At the initial phone interviews, 100 women were successfully interviewed. Twenty-five (25) patients were lost to follow-up. On the second stage of the interview, data collection included the postpartum care plan received by these patients (the questionnaire is available as [Supplementary Material](#)). The clinical practice guidelines of the Brazilian Network of Studies on Hypertension in Pregnancy (RBEHG), entitled "Puerperium: how to manage hypertensive syndromes" [40] were used as the main reference.

Data on antihypertensive medications used in the postpartum period were collected by the research assistant during patient interviews by phone call, at 6 weeks after delivery. Patients were instructed to list all medications used during this period, without the research assistant mentioning any specific medication/class. Medications mentioned by the interviewees were later grouped according to class by the research assistant to facilitate understanding.

Considering childbirth, women responded to questions about gestational age at delivery and route of delivery. Prematurity is a complication associated with PE. It is also the main cause of medically indicated preterm birth in our country. Published national data has reported approximately 11 % of preterm births, in general. A significant rate of medically indicated preterm births is mainly due to hypertension [41].

Concerning the immediate postpartum period, participants were asked about the length of hospital stay in the maternity ward, and whether it had lasted at least until the third day for adequate maternal monitoring in the hospital.

Regarding follow-up after discharge from the maternity ward, the question was about the time interval between maternity discharge and return to the healthcare unit for the first postpartum consultation, whether it had occurred early, still in the first week, or late.

The patients were also asked about the place of postpartum follow-up, whether the referral had been to a primary care unit or secondary/tertiary care facilities, with a multidisciplinary team to monitor preeclampsia patients who had shown signs of severe disease.

There were also questions about the healthcare professionals responsible for patient care, use of antihypertensive agents after delivery, blood pressure monitoring, medical advice received and knowledge about preeclampsia, addressed in the last two questions.

The first open-ended question was about postpartum guidance for preeclampsia patients. High blood pressure during pregnancy and maternal-fetal repercussions were considered adequate answers. In

another open-ended question about the future risks of preeclampsia data on medical advice given to patients on the future repercussions of preeclampsia was retrieved, and divided into cardiovascular, metabolic and renal complications. Finally, a categorical question was asked about the perception of medical care received by puerperal women after delivery. Patients had two response options: "I felt supported" and "I did not feel supported".

At the end of the questionnaire, the interviewees received an information leaflet, prepared by the researchers and based on national guidelines. The leaflet contained explanations about preeclampsia, its risks to the mother, and long-term care required (Supplementary Material). All data were then recorded by the research assistant in a Google Forms document. Information was reviewed by the other authors of the study, with a final descriptive analysis of the results.

3. Results

One-hundred and twenty-four women diagnosed with preeclampsia were invited to participate in the study at the maternity hospital. All patients agreed initially and signed a consent form. Of these, 100 answered the questionnaire after 6 weeks and were included for analysis.

Sociodemographic data was collected in the initial interview, while patients were still in the maternity ward. The majority of women were aged 20 to 34 years, self-declared as predominantly white, almost half of the participants had completed high school and family income was in the lower range in 50 % of cases. Family income was based on the 2020 Brazilian minimum wage: up to 2 minimum wages (up to R\$2,090), 2 to 4 minimum wages (R\$2,090–4,180), 4 to 10 minimum wages (R\$4,180–10,450) and more than 10 minimum wages (maximum R\$10,450). Obstetric history showed that most patients were multiparous (Table 1).

Unfortunately, cases that refused to participate in the study could not be reviewed. No data was available to compare sociodemographic, maternal or perinatal outcomes. This was a study limitation.

Concerning maternal and perinatal outcomes, a significant percentage of women had underlying medical conditions, including gestational or previous diabetes mellitus, chronic hypertension, hypothyroidism, or obesity. The mode of delivery was cesarean section for the majority of women (75 %), with a high frequency of premature births (Table 2).

Overall, we found that 75 % of the cases had preterm births. Of these births, late preterm (34–37 weeks was found in the majority of cases (56 %). Despite the close relationship between preeclampsia and medically indicated preterm birth, the details of whether preterm births were indicated solely due to preeclampsia complications, or patients had

Table 1
Sociodemographic and obstetric information of the women included (n = 100).

Sociodemographic data of study sample		n	%
Age group	Under age 20 years	10	10.0
	20 to 34 years	62	62.0
	35 to 45 years	28	28.0
	Over age 45 years	0	0.0
Race /skin color [45]	White	68	68.0
	Non-white	32	32.0
Family income *	Up to 2 minimum wages (until R\$ 2090)	50	50.0
	2 to 4 minimum wages (R\$ 2090–4180)	44	44.0
	4 to 10 minimum wages (R\$ 4180–10450)	6	6.0
	More than 10 minimum wages (upper R\$ 10450)	0	0.0
School education	Incomplete Elementary Education	15	15.0
	Complete Elementary Education	7	7.0
	Incomplete Secondary Education	16	16.0
	Complete Secondary Education	47	47.0
	Incomplete Higher Education	5	5.0
	Complete Higher Education	10	10.0

* Based on the 2020 Brazilian minimum wage.

Table 2

Maternal and perinatal data of women included (n = 100).

Maternal and perinatal data of study sample		n	%
Comorbidities	Diabetes mellitus 2	9	9.0
	Gestational diabetes mellitus	12	12.0
	Chronic hypertension	25	25.0
	Hypothyroidism	10	10.0
	Obesity	47	47.0
Parity	Nulliparous	41	41.0
	Multiparous	59	59.0
Gestational age at childbirth	Under 34 weeks	19	19.0
	Between 34 and 37 weeks	56	56.0
	Over 37 weeks	25	25.0
Route of delivery	Cesarean section	75	75.0
	Vaginal birth	25	25.0
Duration of postpartum hospital stay	Up to 2 days	6	6.0
	From 3 to 5 days	50	50.0
	Over 5 days	44	44.0

other comorbidities resulting in prematurity, were not the primary objective of our study. Data collection on gestational age and mode of delivery, revealed that 75 % of the participants had preterm births. Among women with preterm births, 86 % (n = 62) underwent a cesarean section, and listed indications were: preeclampsia (58 %) and closely related manifestations, such as HELLP syndrome (5 %) and eclampsia (1 %); in addition to fetal repercussions: fetal distress (8 %), intrauterine growth restriction (5 %), premature rupture of membranes (3 %), oligohydramnios (2 %) and stillbirth (2 %). Failure in labor induction (10 %), repeat cesarean section (5 %) and gestational hemorrhage (2 %) were also listed (results not shown).

It is recommended that the patient should stay in the hospital at least until the third day postpartum for maternal monitoring. The reason is to reestablish circulatory dynamics and fluid reabsorption into the intravascular space which occurs mainly between the third and fifth day postpartum. Interviewees were asked about hospital discharge after delivery. The length of hospital stay varied from 3 to 5 days, in half of the women. However, a significant portion of patients required prolonged hospitalization of more than 5 days (Table 2) [10].

Regarding counseling on postpartum follow-up after hospital discharge, the Brazilian Network of Studies on Hypertension in Pregnancy (RBEHG) recommends that patients with severe preeclampsia should be referred to secondary or tertiary care hospitals and patients without signs of severe disease can be referred to primary care facilities [10]. However, in our study all women were referred to primary care units for postpartum follow-up care, regardless of signs of severe disease and despite the identification of clinical/laboratory deterioration in 10 % of women (Fig. 1).

It is worth noting that, up until the time of the current study, referrals to a multidisciplinary outpatient clinic that provides follow-up care to postpartum preeclampsia patients were unavailable.

During the 6-week postpartum period, antihypertensive drugs were adjusted, with the introduction, combination or even suspension of medication (Table 3). Despite national recommendations to maintain antihypertensive medication in the immediate postpartum period, a significant percentage of patients left the maternity ward without a prescription for antihypertensive drugs. Among those who maintained antihypertensive medication, the majority of patients used only methylodopa. However, patients also cited the use of other drugs: losartan, nifedipine, amlodipine, captopril, enalapril, hydrochlorothiazide, among others. These drugs were grouped into the following classes: angiotensin-converting enzyme inhibitors (ACEI), angiotensin II receptor blockers (ARBs), calcium channel blockers (CCBs) and beta-blockers (BBs), in addition to the combination of different classes.

In relation to postpartum consultations in basic healthcare units, the majority of participants reported that they had no difficulties in returning to the unit (87 %). Nevertheless, patients who did not return for follow-up consultations, reported a lack of time to schedule an

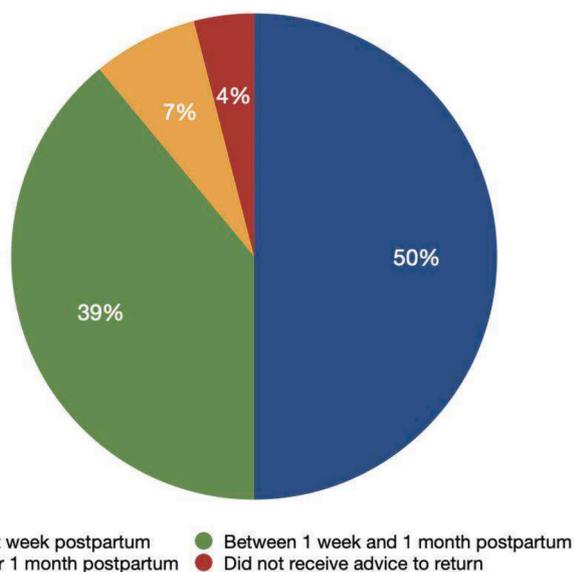


Fig. 1. Information on scheduled postpartum visits (n=100).

Table 3
Classes of antihypertensives used in the postpartum period.

Antihypertensives used in the postpartum period	n	%
None	35	35.0
Methyldopa	23	23.0
Angiotensin-converting enzyme inhibitors (ACEi)	8	8.0
Angiotensin II receptor blockers (ARB)	8	8.0
Calcium channel blockers (CCB)	2	2.0
Betablockers (BB)	1	1.0
Combination of antihypertensives*	23	23.0

ACEi: Angiotensin-converting enzyme inhibitors; ARB: Angiotensin II receptor blockers; CCB: Calcium channel blockers; BB: Betablockers.

* Antihypertensive combinations mentioned by patients: Methyldopa + CCB; ACEi + CCB; ACEi + CCB + thiazide diuretics; Methyldopa + ACEi; Methyldopa + CCB + BB; Methyldopa + BB + thiazide diuretics; Methyldopa + ACEi + CCB; Methyldopa + CCB + ARB; ARB + thiazide diuretics; ARB + CCB.

appointment, lack of available dates at the unit for clinical visits, lack of adequate medical guidance or non-adherence to recommendations (Table 4). It is believed that distance was not an obstacle to follow-up, since patients are sent to referral healthcare centers in the territory where they live. These units are strategically located in the city to facilitate patient access.

From the time between maternity hospital discharge and phone interviews with the study participants, most interviewees had been seen only once by the practitioner (60 %). The obstetrician was the professional mainly responsible for providing care to these patients. A small proportion of postpartum women were seen in 2 consultations or more (15 %), and a quarter of patients did not receive any medical care, either because of failure to return to the healthcare center (13 %) or it was the nursing staff that had provided care (12 %) (Table 4).

The main postpartum offered follow-ups included regular blood pressure checks, management of medication and lifestyle changes with the adoption of a healthy diet and physical activity, in addition to postpartum care follow-up. Almost all consultations failed to inform the patient about the future risks of preeclampsia. A quarter of these women did not receive any guidance during these consultations (Table 4).

In a short-term follow-up, when asked about the frequency of blood pressure measurements, almost a third of the interviewees maintained daily measurements, either checking their blood pressure levels at the healthcare center or at home, using their own device. On the other hand, 16 % did not measure their blood pressure, due to lack of medical

Table 4
Postpartum visits in primary care units.

Return of postpartum women to basic healthcare unit		n	%
Difficulty in returning during the postpartum period (n = 100)	Some difficulty	2	2.0
	Failed to return	13	13.0
	None	85	85
Reasons for failure to return to the basic healthcare unit (n = 13)	Lack of time for consultation	5	38.5
	Lack of available spots in the unit	5	38.5
	Lack of medical advice	2	7.7
	Non-adherence to recommendations	1	15.4
Number of postpartum consultations	None	25	25.0
	One consultation	60	60.0
	Two consultations	11	11.0
	More than two consultations	4	4.0
Professional responsible for medical care	General practitioner	13	13.0
	Obstetrician	68	68.0
	Family doctor	3	3.0
	Nursing	12	12.0
	None	13	13.0
Postpartum counseling*	Arterial blood pressure follow-up	49	65.3
	Use of short-term medication	40	53.3
	Lifestyle habits	26	34.7
	Follow-up at healthcare center	31	41.3
	Long-term risks of preeclampsia	1	1.3
	None	19	25.3

* Postpartum counseling: 166 answers about postpartum guidelines were obtained, among the 100 interviewees, enabling the selection of more than one option.

guidance or lack of their own monitor. It is important to note here that the study did not provide BP monitors and women were able to report blood pressure levels monitored at the healthcare center or at home, using their own device (if available) (Table 5).

In an open-ended question, participants were asked whether they had any knowledge about preeclampsia. The statements obtained were grouped into 6 main possibilities: “high blood pressure during pregnancy” (22 %), “high blood pressure during pregnancy, which can pose risks to the mother and baby” (18 %), “high blood pressure during pregnancy due to placental alteration” (5 %), “dangerous disease” (4 %), “I don’t know” (34 %) and others (17 %). These answers demonstrated that the majority of interviewees (55 %) had insufficient knowledge about the disease. Medical guidance on the pathology of these patients was possibly deficient.

Patients were also asked about the future risks of preeclampsia. In about 98 % of the patients, the responses showed almost a total lack of knowledge about the subject. Finally, in a total of 75 postpartum patients who returned to the healthcare center after giving birth, 53.3 % (n = 40) reported feeling a lack of support from health workers during postpartum consultations (Table 6).

Table 5
Short-term follow-up reported during the postpartum period (n = 100).

Short-term follow-up		n	%
Frequency of blood pressure measurement at home	Daily	32	32.0
	Sporadically	52	52.0
	Not measured	16	16.0
Clinical complications	Hypertensive crisis	6	6.0
	Headache	1	1.0
	Acute renal failure and pulmonary edema	1	1.0
	None	92	92.0

Table 6

Womens' perception of future repercussions of preeclampsia and postpartum healthcare received (n = 75) *.

Patients' understanding of the risks of preeclampsia and postpartum medical care		n	%
Knowledge of future complications of preeclampsia	Aware	2	2.0
	Unaware	98	98.0
Perception of postpartum medical care received	"I felt supported"	35	46.7
	"I did not feel supported"	40	53.3

* Question directed to the group of patients who received postpartum medical care (n = 75).

4. Discussion

Our study explores counseling and follow-up in the postpartum period among women diagnosed with preeclampsia, including their knowledge/understanding of the disease, guidance and postpartum healthcare received. Despite the impact of preeclampsia, which is responsible for over 300 maternal deaths per year and is considered the main cause of maternal death in Brazil [3], the majority of postpartum women interviewed lacked any knowledge about the disease and almost none had been informed about the future risks of preeclampsia.

The perceived lack of knowledge about preeclampsia and its future risks are in line with other studies [18,35,42], possibly correlated to gaps in the type of postpartum care received, marked by few medical consultations, inadequate guidance on the disease and its future repercussions. Furthermore, a significant number of patients were dissatisfied with postpartum support.

Our study distinguishes itself by filling an important gap in the literature. It explores postpartum medical care in patients with preeclampsia in healthcare services after maternity discharge, including postpartum women's knowledge about preeclampsia, and evaluates their related perceptions of postpartum medical care and guidance.

Inadequate postpartum medical follow-up in patients with preeclampsia is not only a regional problem. It is also a global problem that is described and analyzed in international scientific publications, highlighting the American Heart Association (AHA) cohort study. Similar to our study, the AHA cohort study demonstrates that a significant portion of women discontinue postpartum medical follow-up [18].

Likewise, inadequate guidance on the disease and use of antihypertensive drugs were identified. In addition, there was a lack of clarification on the future risks associated with a diagnosis of preeclampsia. This can be explained by the challenges of care coordination between healthcare professionals, especially obstetricians and primary care physicians in postpartum care.

The ideal would be to train these healthcare professionals, through a guideline, with a standardized flowchart for the postpartum monitoring of patients with preeclampsia, in order to establish a short, medium and long-term care plan, based on current scientific recommendations, such as the monitoring proposed by the national protocol of the Brazilian Network of Studies on Hypertension in Pregnancy [40].

It is essential to guide and train these health professionals, obstetricians and clinicians, in order to ensure rigorous and multidisciplinary monitoring, both in the immediate postpartum period and in the long term.

The health professionals involved in this care must be responsible for monitoring modifiable risk factors, including weight, diet, physical activity, laboratory control, lipid profile, blood glucose, kidney function, smoking cessation and guidance on safe contraception and reproductive planning, with the aim of minimizing the risks of future complications.

Risk stratification and referral of complex and high-risk cases are also recommended strategies for adequate patient follow-up. Despite the identification of patients with severe features that would therefore benefit from multidisciplinary care provided by a specialized team, all women in our study were referred back to the primary care unit. Primary

care is often not prepared to manage complex cases of postpartum preeclampsia. In Brazil, primary care provides care for low-complexity cases. In obstetrics, many of these healthcare centers do not have physicians to provide care, and there is a lack of continuous training for healthcare professionals. Referral to high-risk care facilities enables easy access to other specialties such as nephrology and cardiology, among others. Laboratory and imaging tests also provide support for diagnosis and follow-up. Unfortunately, it is difficult to organize healthcare and improve communication after childbirth in low- and middle-income settings.

Extending to medical consultations, not all patients received a specialized consultation with an obstetrician. There was a small number of puerperal consultations. Furthermore, poor guidance was given to patients, especially on the future risks of the disease. The explanation that long-term postpartum follow-up can potentially decrease future damage is still lacking. Postpartum hospitalization is also considered essential to give medical advice to patients about the disease. Early return to the healthcare center after hospital discharge for clinical follow-up is also advised [2].

Data collected in the interviews allowed the identification of deficiencies in the healthcare of postpartum preeclampsia patients. Regarding hospital discharge, at least 2 days of hospitalization in the maternity ward are recommended to monitor circulatory changes and main repercussions on the mother's body. 2 This recommendation was followed by most postpartum women, and a low rate of early discharge from the maternity ward was identified (6 %).

On the other hand, despite recommendations for reevaluation in the first week postpartum [37], the first postpartum scheduled visit, ranged from less than 1 week to more than 1 month. This was concerning, since short-term maternal complications may occur.

Regarding postpartum care in the basic healthcare unit (primary care), access to this service was facilitated, as the majority of women reported. However, there was a lack of active search for patients who did not return for the first week postpartum visit, contacted either by phone calls or even home visits.

Concerning medical care, a low number of consultations was identified. More than half of the participants had only one medical evaluation or were never seen by the medical staff. Responsibility for some of these cases was passed on to the nursing staff of the unit.

As reported by the interviewees, in a large number of consultations there were no recommendations about preeclampsia, disease severity and the possible long-term complications of the disease. A lack of knowledge and support resulted, as indicated by the majority of participants.

This is in accordance with previous studies that have shown patient dissatisfaction with the information about preeclampsia, initiated only after preeclampsia was diagnosed. Superficial knowledge was transmitted and the potential severity of the disease was minimized. Participants also emphasized the lack of participation in decision-making about their healthcare, with gaps in knowledge related to future repercussions and consequent long-term treatment planning [43]. The adoption of a short-term, medium-term and long-term plan was found to be lacking, including arterial blood pressure measurements, follow-up of antihypertensive use, adherence to a healthy lifestyle, with balanced nutrition, engagement in physical activity and periodical exams for cardiovascular and metabolic evaluation.

Current data on morbidity and mortality related to cardiovascular events among women with preeclampsia require that healthcare professionals adopt strategies to prevent future adverse outcomes. These strategies include standardized care protocols, access to education, awareness of patients and healthcare providers of the long-term risk that the disease poses. Preventive measures should be adopted, such as periodical consultations in healthcare centers, home blood pressure monitoring (patients received home blood pressure monitoring kits in the North American study). Blood pressure measurement should be accompanied by adjustment of antihypertensive drugs. In addition,

periodic assessment of cardiovascular risk and multidisciplinary monitoring are also recommended [44,45].

In another recent study, developed at the University of Chicago, it was reinforced that blood pressure control in postpartum women with preeclampsia was closely related to their adherence to postpartum follow-up, including health education measures, with well-established protocols and active involvement of health professionals [46].

This study has a few limitations. There was a restricted number of cases included and the interviewees belonged to the hospital complex only, precluding a comparison with other obstetric care scenarios. Data focused on postpartum follow-up without medical chart review for detailed information on pregnancy outcomes and laboratory findings. Future studies should aim at a larger sample, with multicenter patient monitoring, to assess the provision of postpartum care to preeclampsia patients at a national level.

However, the current study provides insight into the postpartum journey of preeclampsia patients and fills a gap in the literature. It emphasizes the need for structured follow-up of these women and the involvement of trained obstetricians and clinicians to reduce the risk of future repercussions.

Effective interventions to ensure adequate postpartum care and patient counseling after preeclampsia involve political awareness and public health willingness to promote health system organization and training. A multidisciplinary approach should be sought and perhaps include other postpartum counseling methods, such as group care and community-based education.

5. Conclusions

Women were unaware of the long-term repercussions of PE and only one-third experienced support during postpartum care. Medical counseling focused on regular postpartum blood pressure measurement. Overall, the study confirmed the lack of adequate guidance after the diagnosis of PE. There was a low adherence to structured medical follow-up and lack of a short, medium and long-term care plan.

Implementation of clear guidelines on postpartum follow-up is crucial, with tools for continued qualification of healthcare professionals, in addition to surveillance mechanisms by public health providers to implement effective interventions that improve maternal and perinatal health.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Ana Cavalheri reports financial support was provided by National Council for Scientific and Technological Development. Maria Laura Costa reports financial support was provided by National Council for Scientific and Technological Development. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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6. Contributions

Data collection was performed by Cavalheri AC and all the authors contributed to study conception, design, analysis and writing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.preghy.2025.101220>.

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