

Maternal Perceptions and Utilization of Peripheral Intravenous Access in the Postpartum Period

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ABSTRACT

Objective: To report use characteristics and maternal perceptions related to peripheral intravenous catheters in the postpartum period, and the relationship between catheter presence and postpartum activities.

Design: A cross-sectional descriptive study.

Setting/Local Problem: This study was conducted in a maternal and pediatric unit of a regional hospital in Spain.

Participants: A total of 497 women who had a vaginal birth were included.

Methods: Data on the use of peripheral intravenous catheters and women's perceptions were collected by trained nurses from medical records and an ad hoc questionnaire at the time of hospital discharge. A descriptive analysis of the data was performed. Categorical variables were analyzed using the chi-square test, with statistical significance set at $p < .05$.

Results: Most peripheral intravenous catheters (91.5%, $n = 455$) remained unused after childbirth. Furthermore, 71.6% of women would have preferred to have the catheter in place for a shorter time during the postpartum period, and 60.4% found the

insertion site uncomfortable. Moreover, 68.2% reported that the catheter interfered with care and breastfeeding activities.

Statistically significant relationships were found between comfort with the catheter and interference in self-care ($\chi^2 [2, N = 497] = 59.107; p < .001$), neonatal care ($\chi^2 [2, N = 497] = 72.537; p < .001$), and breastfeeding ($\chi^2 [2, N = 497] = 89.084; p < .001$).

Conclusion: A high percentage of peripheral intravenous catheters remain unused during the postpartum period. Furthermore, women reported that these catheters were a hindrance to maternal and neonatal care, as well as breastfeeding. Critically assessing the need to maintain or remove these catheters in the postpartum period, particularly after low-risk births, may enhance women's perceptions during their hospital stay.

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Peripheral intravenous catheters (PIVCs) are one of the most commonly used hospital devices worldwide (Alexandrou et al., 2018; Larsen et al., 2021). They are used to administer fluids, medications, or blood products, and as a result, more than 80% of hospitalized patients have a PIVC inserted (Alexandrou et al., 2018; Kearney et al., 2021; Thomas et al., 2020). However, many of these catheters are placed as a precautionary measure in case of acute complications and then remain unused (Gledstone-Brown & McHugh, 2018). These PIVCs are often referred to in the literature as *just-in-case* catheters (Gledstone-Brown & McHugh, 2018; Webster et al., 2019). Even if they are not used after insertion, they are not free from complications (Webster et al., 2018, 2019); for example, Guihard et al. (2018) reported that 8% of PIVCs inserted without clinical justification, including unused catheters, were associated with thrombophlebitis. This situation is common in many clinical settings, including low-risk childbirth and postnatal care (Kearney et al., 2021; Webster et al., 2018, 2019).

One indication for use of PIVCs in puerperal women is the administration of uterotonics after childbirth, as recommended by the World Health Organization (WHO, 2024) for all births. It

is also used as a precautionary measure to ensure vascular access in the event of postpartum hemorrhage (PPH). Although PPH is the most common complication in the postpartum period, its prevalence is estimated to be between 3% and 5% of births (WHO, 2024).

In Spain, there is no clear consensus on the use of PIVCs during childbirth and the postpartum period. The Spanish National Strategy for Assistance in Normal Childbirth, developed by the Ministry of Health and Consumer Affairs, and the recommendations of the association *El parto es Nuestro* (Childbirth is Ours), endorsed by the Ministry of Equality, discourage the routine use of PIVCs during normal childbirth (Working Group for the Clinical Practice Guidelines on Normal Childbirth Care, 2010; Working Group for the Clinical Practice Guidelines for Pregnancy and Postpartum Care, 2014). However, practices vary across regions, and the decision to insert and remove the catheter is made according to the protocol of each medical center (Basque Health Service, 2018; Regional Health Management of Castile & León, 2019). Despite these differences in recommendations and protocols, PIVCs continue to be used routinely in birthing rooms and maternity units worldwide (Kearney et al., 2021; Webster et al., 2018, 2019).

CLINICAL IMPLICATIONS

- In low-risk childbirth, early removal of the peripheral intravenous catheter (PIVC) may improve maternal comfort and overall perception of the hospital experience.
- A PIVC may interfere with a woman's ability to engage in self-care, neonatal care, and breastfeeding.
- Women should be included in decision-making regarding whether to maintain or remove the PIVC during the postpartum period.

Beyond the clinical purpose of these devices in the postpartum period, it is important to consider how interventions such as PIVC insertion may interact with the daily routines and caregiving activities of women in the immediate postpartum period (Church, 2020; Gaboury et al., 2017). This period is highly demanding both physically and emotionally (Church, 2020), and women focus on developing their skills in caring for their newborns, meeting their nutritional needs, and ensuring their safety (Gaboury et al., 2017). However, some routine and protocol-driven interventions in maternity wards, such as frequent interruptions by health care professionals, unrestricted visiting hours, and poorly designed environments, can negatively affect these caregiving activities, limiting the privacy and dedicated time needed for breastfeeding and mother-newborn bonding (Church, 2020; Gaboury et al., 2017).

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To our knowledge, no studies have reported PIVC use in hospitalized postpartum women, and neither have any examined their potential interference with postpartum activities. For these reasons, this study aims to report use characteristics and maternal perceptions related to PIVCs in the postpartum period, and the relationship between catheter presence and postpartum activities.

Methods

Design

A cross-sectional study was performed in the University Hospital of Vinalopó (HUV) in Elche, Alicante, Spain, from January 2022 to February 2023. HUV is a secondary-level hospital that includes maternal, pediatric, and neonatal units. It manages childbirth from 32 weeks of gestation onward, with an average annual volume of approximately 1,300.

Based on this average annual number of childbirths, the required sample size was calculated with a 5% margin of error and a 95% confidence level, resulting in a sample of 297 participants. The final sample comprised 497 women, exceeding the calculated minimum.

Variables and Measuring Instruments

The study variables were divided into three main categories:

1. Sociodemographic and postpartum data: age, type of vaginal birth (spontaneous/augmented), neonate's feeding method (breast/artificial/mixed), presence of PPH (yes/no), where the hemorrhage occurred (birthing room/hospital ward), and need for intravenous treatment in the birthing room (yes/no).
2. Variables related to the PIVC: having a PIVC (yes/no), catheter size (18/20/22 gauge), insertion site (back of the hand/wrist/forearm/inner elbow), use of the catheter (yes/no), administered medication in the maternity ward (no medication administered/analgesia/antibiotics/analgesia and antibiotics/others), local complications (no complications/phlebitis/extravasation/occlusion/dislodgment), and the duration of postpartum PIVC placement (from childbirth until discontinuation), recorded by date and time of removal.
3. Perception-related variables: preexisting desire to avoid a PIVC (yes/no/indifferent), explicit request not to have a PIVC inserted (yes/no), preference for a shorter PIVC insertion time (yes/no/indifferent), comfort with the PIVC (yes/no), preferred insertion site (back of hand/wrist/forearm/inner elbow/indifferent), and interference with postpartum activities (self-care, neonatal care, and breastfeeding; yes/no).

Inclusion and Exclusion Criteria

Although all women receive a PIVC during childbirth according to hospital protocol, only those who had given birth vaginally, agreed to participate in the study, and were in the postpartum period (defined as the first 48 hours after childbirth, from

admission to the ward until hospital discharge) were included. Women who had a cesarean birth were excluded, as hospital protocol requires them to receive intravenous medication during the postpartum period. In addition, women who declined participation were also excluded.

Data Collection Procedure

The sample was selected using consecutive sampling. Data were collected by six nurse field researchers daily during the morning shift. At the time of hospital discharge, the nurse responsible for each potential participant, after confirming that she met the inclusion criteria, invited her to take part in the study. An information sheet was provided, and the study was explained verbally, emphasizing the participants' anonymity and their right to withdraw from the study at any time. Written informed consent was then obtained.

To protect privacy, participants were assigned sequential numerical codes, and no personally identifiable information was recorded in the study database. Demographic, postpartum, and PIVC-related data were retrieved from participants' medical records, and data on women's perceptions of having a PIVC were collected using an ad hoc questionnaire administered verbally by the nurses. This questionnaire was developed by the research team, drawing on the previous experience working with postpartum women and informed by a review of the relevant literature.

To ensure consistency in measurement across all participants, the lead researcher conducted an initial training session for the field researchers and provided ongoing training for new team members who joined during the study period.

Statistical Analysis

A descriptive analysis of the data was performed, with quantitative variables (such as age and the duration of postpartum PIVC placement) described using means and standard deviations, and categorical variables (such as type of vaginal birth, use of the PIVC, or local complications) described using absolute values and their frequencies. Bivariate analysis of

categorical variables was performed using the chi-square test. The statistical significance level was set at $p < .05$. All statistical analyses were performed using IBM SPSS Statistics (Version 28.0).

Ethical Considerations

This study was approved by the Ethics Committee for Drug Research of the HUV and was conducted in accordance with the principles outlined in the Declaration of Helsinki and the Good Clinical Practice Guidelines of the European Union. All participants were informed about the study by the researcher, and informed consent was obtained before participation.

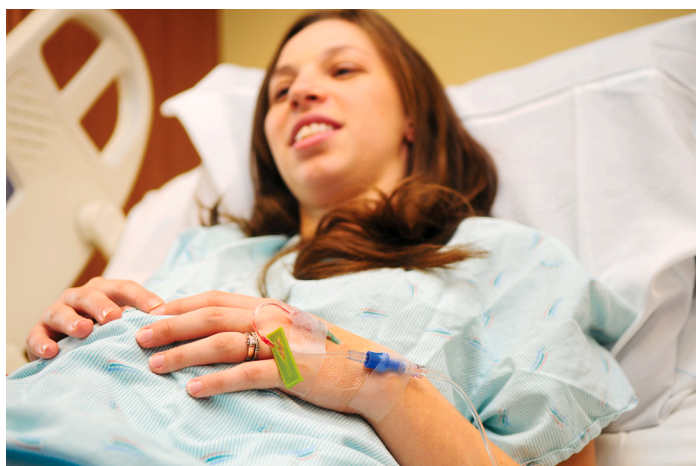
Results

A total of 497 women with a mean age of 32 years ($SD = 5.3$ years) participated in the study. Of these, 475 (95.6%) had an uncomplicated vaginal birth and 408 (82.1%) chose to breastfeed exclusively. Only 15 participants (3.0%) experienced PPH, with all of these cases occurring in the birthing room within the first 2 hours postpartum. Seventeen participants (3.4%) required intravenous medication in the birthing room before admission to the ward.

Regarding PIVCs, the 18-gauge catheter was the most frequently used ($n = 491$; 98.8%), with the antecubital fossa being the most common insertion site ($n = 183$; 36.8%). Of all the PIVCs inserted, the majority ($n = 455$; 91.5%) remained unused during the hospital ward stay after childbirth. Complications were reported in 34 cases, with dislodgment being the most common ($n = 12$; 2.4%; see Table 1).

In terms of the women's perceptions, most of them ($n = 356$; 71.6%) would have preferred the PIVC to be removed earlier, and 300 (60.4%) found its placement uncomfortable. Furthermore, 339 (68.2%) reported that the PIVC had interfered with postpartum activities (see Table 2).

Statistically significant relationships were found between catheter insertion site and its effect on care activities in the postpartum period ($\chi^2 [3, N = 497] = 9.899$; $p = .019$) and between user comfort and the interference with these



It is important to consider how interventions such as PIVC insertion may interact with the daily routines and caregiving activities of women in the immediate postpartum period

TABLE 1 CHARACTERISTICS OF PIVCS
(*N* = 497)

Variable	<i>n</i> (%)
Women with a PIVC	497 (100)
Duration of postpartum PIVC placement, <i>M</i> (<i>SD</i>), hr	25.3 (10.8)
PIVC size	
18 gauge	491 (98.8)
20 gauge	5 (1.0)
22 gauge	1 (0.2)
Insertion site	
Back of the hand	70 (14.1)
Wrist	147 (29.6)
Forearm	97 (19.5)
Inner elbow	183 (36.8)
Use of the PIVC	
Yes	42 (8.5)
No	455 (91.5)
Administered medication in the maternity ward	
No medication administered	455 (91.5)
Antibiotics	19 (3.8)
Analgesia	11 (2.2)
Antibiotics and analgesia	3 (0.6)
Others	9 (1.8)
Local complications	
No complications	463 (93.2)
Phlebitis	9 (1.8)
Occlusion	3 (0.6)
Extravasation	10 (2.0)
Dislodgment	12 (2.4)

Note. PIVC = peripheral intravenous catheter; *n* = absolute frequency; % = relative frequency.

TABLE 2 WOMEN'S PERCEPTIONS OF THE
PIVC (*N* = 497)

Variable	<i>n</i> (%)
I wanted to have a PIVC	
Yes	150 (30.2)
No	110 (22.1)
Indifferent	237 (47.7)
I requested not to have a PIVC	
Yes	22 (4.4)
No	475 (95.6)
I wanted to have the PIVC for a shorter period	
Yes	356 (71.6)
No	64 (12.9)
Indifferent	77 (15.5)
The PIVC was comfortable	
Yes	197 (39.6)
No	300 (60.4)
I preferred the PIVC to be placed in another location	
Back of the hand	49 (9.9)
Forearm	81 (16.3)
Wrist	37 (7.4)
Inner elbow	18 (3.6)
Indifferent	312 (62.8)
The PIVC interfered with my postpartum activities	
Yes	339 (68.2)
Self-care	244 (49.1)
Neonatal care	253 (50.9)
Breastfeeding	292 (58.8)
No	158 (31.8)

Note. PIVC = peripheral intravenous catheter; *n* = absolute frequency; % = relative frequency.

activities (χ^2 [2, *N* = 497] = 92.680; $p < .001$; see [Table 3](#)). The forearm was the preferred insertion site for mothers (n = 81; 16.3%).

Discussion

In this study, most of the PIVCs inserted in women for child-birth were not used in the postpartum period. In addition, more than half of the participants felt that the presence of the PIVC

was a hindrance to their self-care, neonatal care, and breastfeeding.

Our results indicate that 91.5% of catheters inserted were not used. No previous studies have specifically examined the percentage of unused PIVCs in puerperal women; nevertheless, research by [Webster and colleagues \(2019\)](#) found that 16% of PIVCs placed in this population had no justified medical indication. Although these outcomes measure different aspects (postpartum use in our study vs. justification for

TABLE 3 CORRELATION BETWEEN PIVC VARIABLES AND INTERFERENCE WITH CARE

Variable	Interference With Postpartum Care	Interference With Self-care	Interference With Neonatal Care	Interference With Breastfeeding
PIVC location	.019*	.007*	.001*	.006*
PIVC size	.240	.548	.564	.434
Comfort with the PIVC	<.001*	<.001*	<.001*	<.001*
PIVC use	.627	.276	.398	.906
Intravenous treatment	.641	.360	.360	.648

Note. PIVC = peripheral intravenous catheter.

* $p < .05$.

placement in theirs), both highlight the potential overuse of PIVCs in women during the puerperium. Thus, evidence specific to puerperal women remains scarce, but similar patterns of unnecessary PIVC use have been reported in other hospital settings, such as emergency departments, where rates vary from 17% to 40% (Evison et al., 2021; Gledstone-Brown & McHugh, 2018; Thomas et al., 2020).

The preemptive insertion of PIVCs in puerperal women is typically done in anticipation of complications, most notably PPH (Kearney et al., 2021; Webster et al., 2018, 2019). However, Bailey and colleagues (2020) found no association between urgent PIVC insertion and poorer outcomes, such as decreased hemoglobin or increased blood transfusion rates, compared to prophylactic insertion. These findings suggest that routine PIVC insertion may not be clinically necessary and could be reserved for situations where risk is clearly present.

Beyond the decision to insert a PIVC, it is also important to consider catheter size and insertion site once its use has been deemed necessary (Zingg et al., 2023). In our study, 18-gauge catheters were used in nearly all our participants (98.8%). This aligns with findings from Webster and colleagues (2019) and Kearney and colleagues (2021), who reported usage rates of 42% and 80%, respectively. This use of large-gauge catheters is often justified as a preventive measure for rapid fluid or blood product administration in emergencies, particularly in cases of PPH (Kearney et al., 2021; Webster et al., 2018, 2019). However, the actual need for blood transfusion remains low in these scenarios, with incidence rates of 2% to 7% in PPH and just 0.53% in women who underwent cesarean birth (Bao et al., 2016).

In terms of insertion site, the antecubital fossa was most commonly used in our study (36.8%). In contrast, Webster and colleagues (2019) and Kearney and colleagues (2021) had more frequent use of the hand and wrist. These differences may reflect regional variations in clinical practice. Alexandrou and colleagues (2018) found geographic differences in general hospital populations, with the antecubital vein preferred in Australia and New Zealand, and the hand more commonly used in the Middle East.

Although large-gauge PIVCs and upper-limb insertion sites are widely used, they may carry risks. In a study of the general hospital population, Wallis and colleagues (2014) found that catheter size, female sex, younger age, and insertion at the hand, wrist, or antecubital fossa were associated with a higher risk of phlebitis, occlusion, or dislodgment, the latter being the most common complication reported in our study. Based on these findings, 20-gauge catheters and forearm insertion may be preferable, particularly for low-risk patients.

In addition to the clinical considerations, the impact of PIVCs on patient perceptions should be considered. Approximately half of the participants in our study reported that the catheter interfered with their ability to provide care and breastfeed. Statistically significant associations were found between interference and both insertion site and comfort. These findings raise important questions about how routine catheter use aligns with the WHO's (2018) recommendations for respectful maternity care, which emphasize freedom from harm and informed

choice. With this in mind, puerperal women should be included in decisions about PIVC insertion and use to promote more positive postpartum perceptions (Brady et al., 2019).

Although no previous studies have explored the perceptions of PIVC use specifically in puerperal women, similar themes have emerged in other populations. For example, Larsen and colleagues (2017) found that patients reported interference with rest and daily activities, particularly when catheters are placed in the antecubital fossa or hand. The forearm was associated with more positive perceptions, findings that mirror our own.

Implications for Practice

PIVC is a standard clinical practice during childbirth and is routinely performed on all women, with catheters often remaining in place throughout the postpartum period. However, findings from our study indicate that a significant proportion of these catheters are not used, suggesting limited clinical utility in many cases.

Women's feedback also highlights that the presence of a PIVC may hinder early mother-newborn interactions, including care and breastfeeding, potentially affecting the quality of postpartum care. In light of these findings, clinical teams are encouraged to critically assess the necessity of maintaining a PIVC following uncomplicated, low-risk births. When its continued use is not clearly justified, early removal should be considered, with women actively involved in the decision-making process. Removing an unnecessary PIVC may support more fluid and comfortable mother-newborn care practices in the postpartum period, ultimately enhancing women's overall perception of the hospital experience.

In addition, given the reported discomfort and interference associated with PIVCs, it is important to reconsider the routine use of 18-gauge catheters in all women. Catheter size should be selected based on clinical indication, and insertion site should prioritize comfort and functionality, such as placing the catheter in the forearm rather than more limiting sites such as the antecubital fossa.

These recommendations align with a woman-centered, evidence-informed approach to obstetric nursing care, advocating for clinical practices that are both effective and respectful of women's autonomy, comfort, and postpartum perceptions.

More than half of the participants felt that the presence of the PIVC was a hindrance to their self-care, neonatal care, and breastfeeding

Limitations

One limitation of this study is its cross-sectional descriptive design, which does not allow for establishing causality. In addition, the study was conducted in a single hospital, which

limits the generalizability of the findings. Another important consideration is that the sample included only women who had a vaginal birth; women who underwent cesareans were excluded. However, understanding their perceptions of having a PIVC could influence the findings, as this group typically experiences a longer and more complex postpartum recovery.

Also note that the perceptions of participants were collected at the time of hospital discharge and by nursing staff, which could have influenced responses if women felt less comfortable sharing negative feelings in that context. Furthermore, no statistical adjustments were made for variables such as parity, length of hospital stay, or the occurrence of labor complications, which could potentially affect both the use of PIVCs and women's perceptions. In addition, the questionnaire used to assess women's perceptions has not been previously validated, which may limit the reliability and validity of the data obtained. Moreover, because participation in the study was voluntary and included a survey, a self-selection bias may be present. This could affect the representativeness of the findings and limit the generalizability of the results.

Finally, continuous data collection was not fully achievable due to the availability of the research team, potentially resulting in the omission of some eligible cases.

Conclusion

With this study, we found that 91.5% of PIVCs inserted in puerperal women as a precaution against potential complications remained unused during hospitalization. In addition, women identified the PIVC as a factor that interfered with their self-care, neonatal care, and breastfeeding. Statistically significant relationships were observed between these activities and both the insertion site and perceived comfort, with the forearm identified as the preferred site by most participants.

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Author Disclosures

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