# Postpartum program actions in primary health care: an integrative review

Tatiane Baratieri (https://orcid.org/0000-0002-0270-6395) <sup>1</sup> Sonia Natal (https://orcid.org/0000-0001-6155-4785) <sup>1</sup>

Abstract Puerperium is a period of significant morbimortality for women, and Primary Health Care (PHC) is important in developing actions to meet women's health needs. This study aimed to systematize the knowledge produced on postpartum care programs actions within PHC at both national and international levels. This is an integrative review of the literature in databases LILACS (Latin American and Caribbean Health Sciences Literature), BDENF (Nursing Database), SciELO (Scientific Electronic Library Online) and PubMed (US National Library of Medicine). Search was performed in the period April-May 2017. Forty-three papers met the selection criteria. Results indicate that PHC has the physical structure to provide puerperae with care, but has a shortage of human and material resources; there is low postpartum consultation coverage and home visits; there is a good evaluation of the incentive for breastfeeding, but focused on the child; international screening of Postpartum Depression through the Edinburgh Postnatal Depression Scale and care shortage for this condition in Brazil. Postpartum care still focuses on care for the newborn and is mostly restricted to the immediate and late puerperium.

**Key words** Primary health care, Postpartum, Women's health

<sup>&</sup>lt;sup>1</sup>Universidade Federal de Santa Catarina. R. Eng. Agronômico Andrei Cristian Ferreira s/n, Trindade. 88040-900 Florianópolis SC Brasil. baratieri.tatiane@gmail.com

#### Introduction

Although life expectancy is higher for women than for men in most countries, a number of social and health factors combine to have a lower quality of life for women<sup>1</sup>. Gender inequality leads to many risks to women's health, including physical and sexual violence, sexually transmitted infections, malaria, chronic obstructive pulmonary disease and maternal morbidity and mortality<sup>1</sup>.

Mortality rates during pregnancy and childbirth remain high in developing countries, despite their worldwide decline in recent decades, with 99% of maternal deaths occurring in these countries1. Avoidable deaths continue to occur in alarming proportions, mainly due to hypertensive diseases, hemorrhages, sepsis/infections and abortion-related complications<sup>1,2</sup>.

Maternal health is sensitive to Primary Health Care (PHC)<sup>2,3</sup>. Thus, increasing the quality of this point of care is key to reducing the mortality rates of this population. Deaths and morbidities during pregnancy, childbirth and puerperium are avoidable by implementing integrated and universal access actions through light technologies and primary care<sup>2,3</sup>.

It should be noted that most maternal deaths are concentrated in the immediate puerperium (1-10 days postpartum), besides being a significant morbidity stage4,5 that extends to late puerperium (from the 11th to the 45th day) and remote puerperium (after 45 days)6, with studies that indicate persistent conditions for more than 4 years postpartum<sup>7,8</sup>. PHC is primarily responsible for postpartum women care through integration of technical knowledge and an ability to receive, support and detect early physical and emotional changes, performing prevention, treatment and follow-up on women referring to others services when needed<sup>9,10</sup>.

Considering the significant morbimortality of women in the puerperal period, and the fact that PHC is the caregiver responsible for solving most health problems, it is important to develop efficient and effective actions to meet the needs of women's health in the puerperium.

To that end, health policies at national and international levels work together and establish guidelines, actions and strategies for puerperal care, especially in primary care, understanding that adequate resources are essential requirements for comprehensive care<sup>1,6</sup>. Despite these initiatives, there is evidence that postpartum care in PHC requires adjustments, with improvements in physical and material structure, management and care in health services, professional qualification, women-centered care, overcoming technicist care, thus contributing to improved women's  $health^{7,10\text{-}12}.$ 

Knowing the activities developed and results achieved by puerperal care programs is important for the planning and improvement of PHC care for postpartum women's health. Based on the above, we enquire as to the characteristics and results of the studies that address postpartum care in the context of PHC. Thus, this study aimed to systematize knowledge produced on postpartum care in PHC both at national and international levels.

#### Methods

This is an integrative review of the literature, which is characterized by a method that allows the search, critical evaluation and synthesis of available evidence about the subject investigated, whose final product consists of the current state of knowledge, implementation of interventions and identification of gaps that guide the development of other studies<sup>13</sup>.

The operational stages of the integrative review are identification of the theme and selection of the hypothesis or research question; establishment of inclusion/exclusion criteria of studies/sampling or search in literature; definition of the information to be extracted from the selected studies/categorization of studies; evaluation of studies included in the integrative review; interpretation of results; and presentation of knowledge review/synthesis<sup>13</sup>.

The following guiding question was formulated in the first step: What are the characteristics type of study, criteria, parameters, indicators - and results of the studies that address postpartum care in PHC?

In the second step, we searched for references through the Virtual Health Library (BVS), with simultaneous search in the main national and international databases, and we selected LILACS (Latin American and Caribbean Health Sciences Literature) and BDENF (Nursing Database). We conducted advanced search in SciELO (Scientific Electronic Library Online) and PubMed (National Library of Medicine of the United States).

We established the following inclusion criteria for the selection of papers: original work, answering the guiding question; published in Portuguese, English or Spanish; published in a scientific journal with at least Qualis B2 for public health; and when Qualis evaluation was unavailable, we verified the Journals Impact Factors (JCR), including papers with a minimum rating of 1.0. Duplicated studies in one or more databases were excluded.

The search for references occurred between April and May 2017 using the following descriptors indexed in Health Sciences Descriptors (DeCS), all of which were grouped using Boolean expressions AND and OR: período pós-parto OR postpartum period OR período pós-parto OR saúde materna OR maternal health OR salud materna OR saúde da mulher OR women's health OR salud de la mujer OR saúde materno-infantil OR maternal and child health OR salud materno infantil AND Atenção Primária à Saúde OR Primary Health Care OR Atención Primaria de Salud OR Saúde da Família OR Family Health OR Salud de la família. In PubMed, we used the following Mesh Terms: postpartum period OR maternal health OR women's health AND primary health care OR family health.

The wide range of descriptors used is justified since the postpartum subject is handled in conjunction with others related to women's health, and restriction to descriptor "postpartum period" would limit the possibility of finding studies that approach the subject. Given the relevance of some studies, we selected references that considered the inclusion criteria of the study cited by the selected articles.

In order to evaluate the methodological quality of studies found, we used specific tools for each type of study. Evaluative studies were analyzed through by adapting the meta-evaluation criteria established by Stufflebeam<sup>14</sup>, excluding studies classified as "weak" and "reasonable", that is, with more than 50% of the evaluation questions answered negatively. The other studies were evaluated using the Critical Appraisal Skills Program (CASP)<sup>15</sup>, which consists of specific checklists for each type of study, and does not suggest a scoring system, so the authors chose to use the same classification of Stufflebeam<sup>14</sup>, excluding reasonable and poor studies. These studies, except evaluative ones, were also classified according to their level of evidence, according to the criteria of Stetler et al. 16.

For the accomplishment of the third stage (definition of the information to be extracted from the selected studies), the tool elaborated by Ursi<sup>17</sup> was used, which addresses, among other information, the study identification, methodological characteristics, evaluation of methodological rigor, interventions and results found.

The results of the selected studies were systematized according to similarities of data analyzed in each research. Data synthesis and inter-

pretation were based on the results of the critical evaluation of selected studies. A comparison was made with theoretical knowledge, identification of conclusions and implications resulting from the integrative review.

In order to minimize bias, two reviewers performed the search, evaluation and selection of studies, and then a consensus discussion was held on papers to be included in the review.

#### Results

After completing cross-referencing between the DeCS / Mesh Terms, 1,974 references were found, and at the end of the material selection strategies, 43 papers were shortlisted for analysis and discussion, as shown in Figure 1.

Year of publication of papers ranged from 1995 to 2016, with 69.8% (30) in the last five years, with 20.9% (9) published in 2013. Regarding the study site, 60.5% (26) were performed in the American continent, mainly Brazil, with 51.2% (22). Other studies were held in Europe, 6 (14%), Oceania, 6 (13.9%), Asia, 2 (4.7%), Africa, 2 (4.7%) and one in three countries, Bangladesh and Nepal (Asia) and Malawi (Africa). The main three languages were English, 51.2% (22), followed by Portuguese, 44.2% (19), and 4.7% (2) Spanish.

Most studies were quantitative (76.7%) (33), and 37.2% (16) are evaluative, 20.9% (9) qualitative, 13.9% (6) cross-sectional, 11.6% (5) clinical trial, 7% (3) cohort and the same quantity of quasi-experimental, and one was descriptive. Regarding evaluation of methodological quality, 12.5% (2) of the 16 evaluative papers were rated excellent, 56.25% (9) very good and 31.25% (5) good, with two value judgments<sup>18,19</sup>. The others were classified by level of evidence, predominantly at level IV, 59.3% (16), followed by level III, 22.2% (6) and level II, 18.5% (5); and regarding CASP, most were classified as very good, 51.8% (14), 25.9% (7) as excellent and 22.2% (6) as good.

The main results of the analyzed papers are shown below, grouped by similarities for a better understanding:

### Evaluation of the structure of puerperal care health facilities

Of the evaluative papers, three<sup>11,20,21</sup> addressed the evaluation of the structure for puerperal care, all performed in Brazil. Puerperal care is mainly provided by doctors and nurses<sup>11,20</sup>, with problems mainly in fixing and qualifying doctors in

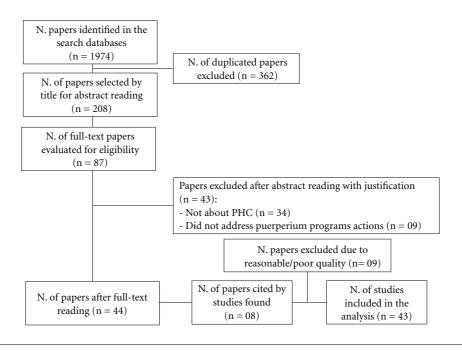


Figure 1. Flowchart of the paper selection process as per PRISMA/2015.

PHC<sup>11</sup>. In the Santos (SP) study, the introduction of nutritionists was evaluated; this initiative is insufficient, professionals are found in about 65% of facilities for one or two periods of the week<sup>21</sup>.

Regarding the evaluation of the physical and material structure, the studies found that most of the health establishments had a minimum infrastructure for puerperae care, such as single room and availability of materials, vaccines and medicines. However, one of the limitations of care is the availability and maintenance of the functionality of materials<sup>11,20,21</sup>. The studies also pointed out poor health education actions and inadequate or non-existent physical space for this purpose<sup>11,20,21</sup>.

# Postpartum consultation: demand/supply and reasons for non-adherence

Studies evaluating prenatal care, as recommended by the Pre-Natal and Birth Humanization Program (PHPN) in Brazil, have shown, since implementation to date, that the recommendation to have six or more prenatal consultations, all basic exams, HIV testing, the 2<sup>nd</sup> dose, booster or immunizing tetanus vaccine and puerperium consultation is poorly complied with<sup>20,22,23</sup>.

Regarding Brazilian studies that evaluated the indicator of puerperium consultation up to 42 days postpartum, a low achievement was observed, varying from 16.8% to 58%<sup>24-26</sup>. A lack or little flexibility of prior scheduling of puerperal consultation<sup>11,18</sup> and hosting the First Comprehensive Health Week<sup>18,21</sup> were identified. Studies indicate that active search for defaulting women is performed in more than half of the studies, but it is not a systematic practice for all puerperae<sup>11,20,21,25</sup>.

A study carried out in nine poorer regions of Peru showed that 58% of women reported postpartum control within 42 days<sup>27</sup>. A survey conducted in the UK in 1995 found that 91% of women attended the puerperal consultation six weeks into postpartum<sup>28</sup>.

International and national literature shows the reasons for not adhering to the puerperal consultation, and they are: professionals' lack of information on postpartum actions<sup>4,5</sup>; lack of medicines and equipment; lack of professional qualification; cultural barriers<sup>4</sup>; and perception that postpartum care is intended for the child<sup>4,5,7</sup>. In addition, puerperae educational actions are still traditional, which also discourages their participation<sup>29</sup>.

In Australia, it has been shown that problems related to the occurrence of postpartum care in an organized and higher quality way is due to the lack of consistent and cohesive guidelines for community care of new mothers and their babies<sup>5</sup>. Two Australian studies<sup>5,7</sup> and one from the UK<sup>28</sup> identified that puerperae value and are open to primary care<sup>5,7,28</sup>, provided that consultation is a time of understanding, support and reassurance and are more likely to talk about their needs when asked about them<sup>5,7</sup>.

## Addressing women in puerperal consultation

Regarding actions performed by professionals during puerperium consultation, a survey in the UK indicates that 93% of the women had abdominal examination and 70% vaginal examination. However, many women are submitted to exams with no obvious reason (such as unnecessary vaginal examination), while other tests that may be useful for some conditions (such as hemogram for fatigued women) are used infrequently<sup>28</sup>.

Brazilian studies indicate that the most common activities carried out in the puerperium by health professionals, besides encouraging breastfeeding, are guidelines on contraception methods<sup>18,25</sup>, food and nutrition<sup>18,21</sup> and use of ferrous sulfate18. Less frequent actions are cytopathology of the uterine cervix24, clinical breast examination<sup>18,24</sup>, investigation of women's emotional state, orientation regarding return to sexual intercourse, evaluation of lochia and examination of the genital region<sup>18</sup>. A national study that evaluated puerperal care among adolescents classified it as adequate for 43.2% of the users, and the other ones received intermediate or inadequate care, considering in this evaluation the consultation of puerperal review, home visit in the first week after childbirth, clinical and gynecological evaluation, guidance on family planning, and guidance on breastfeeding<sup>25</sup>. In Peru, it was found that only 38.5% of the women used ferrous sulfate and 12.6% vitamin A 30 days after delivery, and 31% had chosen a contraceptive method<sup>27</sup>.

During the first 3 months postpartum, Australian studies indicated that 89% of women had sexual health problems, and although most women had contact with PHC professionals during that time, only 24% remembered being asked about the theme by general practitioners and 14% by nurses<sup>30,31</sup>. Women expressed dissatisfaction with the quality of postnatal primary

health care, reporting a strong shift from maternal health to baby health after birth<sup>30</sup>.

#### Home visit as a postpartum care tool

Of the 42 studies selected for the review, nine addressed the topic of home visits (HV) in the postpartum period, four of them national<sup>18,21,25,32</sup> and five international<sup>33-37</sup>. Four studies indicate a low level of HV<sup>18,21,25,33</sup>, and the same occurs more frequently in Brazil when it comes to family health facilities, performed mainly by Community Health Workers<sup>18,25</sup>. HV are more likely when the team monitors women during the prenatal period<sup>18,33</sup>.

As to the positive impact of HV programs during the gestational-puerperal cycle, international studies have pointed to reduced tobacco use among puerperae<sup>34</sup>, improved care and development of the child<sup>36,37</sup>, greater social and psychological support to women and households<sup>37</sup>, and three international<sup>34-36</sup> and two national<sup>21-32</sup> studies reported increased exclusive breastfeeding was identified up to six months. A multiprofessional team is required to perform postpartum HV, which influences the improvement of the quality of care and nears ties between the team and women/households<sup>21,37,38</sup>.

#### Breastfeeding

From the reviewed studies, breastfeeding appeared as the main action addressed by professionals in Brazil, and is a subject poorly investigated internationally when addressing actions regarding puerperae in PHC. Seven Brazilian studies have evaluated the impact of its prevalence before and after breastfeeding promotion initiatives (such as "breastfeeding-friendly basic facility" or "Brazil breastfeeding network"), identifying that such actions contribute to an increased rate of breastfeeding, both exclusive up to six months and subsequent to this period<sup>19,32,39-41</sup>. Two studies did not find statistical significance in their results, although they also showed superiority in the percentage of breastfeeding after the implementation of the initiative<sup>42,43</sup>.

A study carried out in Francisco Morato/SP, which evaluated the knowledge of health professionals about breastfeeding showed that they recognize the importance of breastfeeding for the mother-child binomial, but more easily mention the benefits to the child. In addition, although women receive guidance, they have limited knowledge on the subject<sup>44</sup>.

#### Postpartum depression (PPD): non-specialized management in PHC

The international literature shows that PPD screening programs in PHC can improve women's mental health outcomes in the postpartum period<sup>45-49</sup>, even in low-income regions with lowcost technologies, as pointed out by Chilean<sup>47</sup> and Australian<sup>50</sup> studies. The Edinburgh Postnatal Depression Scale (EPDS) validated in several countries is recognized as the main PPD tracking tool by non-specialized professionals in PHC<sup>45-49,51</sup>.

It is emphasized that public health nurses are well positioned to identify and treat depressed women and refer them when needed. A small investment in the training of nurses to identify and treat PPD may have a positive long-term effect<sup>45,48</sup>.

According to an Australian study<sup>50</sup>, a health professional's investigation about the past or current mental health of women is associated with the search for help throughout the perinatal period. In Denmark, it was found that puerperae who developed a psychiatric episode had higher rates of consultation by health professionals before, during and after pregnancy<sup>52</sup>.

Barriers to treatment of PPD were evidenced by a study in Chile, such as lack of user knowledge about the disease, negative conceptualization and rejection of the available treatment options; poor network support and long waiting times and a lack of coordination between clinical and administrative decisions<sup>53</sup>.

Among studies that addressed PPD, three were national and identified insufficient knowledge by PHC professionals to prevent and treat PPD, lack of a systematic tool for PPD screening and that work focus during gestation and postpartum is still biological<sup>54-56</sup>.

#### Discussion

The bibliographic search in this study started with a large number of references (1,974), and 43 were selected for analysis according to inclusion and exclusion criteria. Most of the references that made up the initial sample of the search addressed child health or women's health at other periods of life unrelated to puerperium.

We can affirm that literature that addresses women's care in the puerperium in the context of PHC is scarce, since most studies selected did not provide a comprehensive approach to puerperal care, so evidence was limited to one-off issues of specific actions, and evaluative studies were restricted to process evaluations only. Of the studies that evaluated the puerperium process, only Silva et al.18 conducted a more extensive investigation of the actions carried out in puerperium, while others, mainly Brazilians, mostly limited themselves to investigating the number of postpartum consultations and impact of breastfeeding promotion programs.

An increased national and international scientific production was noted in the last 5 years, indicating a rising concern for women's health in the puerperium, possibly by the promotion of strategies aimed at reducing maternal and child morbimortality, for example, proposed by the Sustainable Development Goals, and adopted by several countries. Despite worldwide decline, in the last decades, maternal and infant mortality remains a public health problem, especially in developing countries, and developed countries identified the need to qualify care for women in the postpartum period to reduce maternal morbidity, which may also have fueled increased studies in recent years.

According to the studies analyzed, puerperal care provided in PHC predominates in postpartum consultation and breastfeeding indicators, in national papers and home visits and PPD programs conducted mainly at the international level. Other aspects of care, such as assessment of physical structure and materials, health professionals and other activities performed in the puerperium (general guidelines, physical assessment and social vulnerability assessment) are poorly investigated.

In Brazil, investigations are restricted to the immediate and late puerperium, addressing remote puerperium only when it comes to breastfeeding, and the latter focusing on the child. International studies dealt with remote puerperium in a maximum of two and a half years postpartum34,36, with a predominance of PDD investigation<sup>46-48,50-52</sup>. While many women traverse puerperium without intercurrences, others experience significant issues that may persist for weeks, months or even more than 4 years after giving birth<sup>7,8</sup>, indicating these women's need for care over time.

Considering that maternal health is PHC-sensitive<sup>2,3</sup> and that this point of care should provide care for women longitudinally, there is a need to qualify such actions in order to follow-up on women in all stages of puerperium, including the remote stage, neglected not only by public policies and clinical guidelines3,6,57, but also in scientific studies. It is noteworthy that most of PHC care is low cost and has significant results in reducing maternal morbimortality with integrated and universal access actions<sup>2,3</sup>.

Results showed that, in developing countries (Brazil and Peru), the puerperal consultation still does not occur with a satisfactory frequency, and maternal mortality rates remain high in such countries. There is a need for change in PHC access policies for women, their partners and/or family members during this period, which could affect the improvement of maternal and child morbimortality rates. Most studies approach the topic of puerperal consultation only as to its frequency rather than investigating their quality.

The highest risk of mortality is during the immediate and late postpartum period, with a higher morbimortality rate in the first postpartum week, which makes it a critical time for women and their child. Postpartum consultation is a primary intervention to reduce maternal morbimortality through prevention, early detection and treatment of complications, and advice on contraception<sup>4,5</sup>. However, this action does not seem to provide an opportunity for women to have their health needs met, either because of poor quality of care<sup>28</sup> or because of the low frequency of these consultations<sup>23</sup>.

In addition to the low frequency of puerperal consultation, results of the studies on the topic "women approach in puerperium consultation" indicate the incipient and poor care provided in PHC, with fragmented, biologicist care, childcare priority, focus on the "mother" role and not in women and their needs, in both national and international studies.

International clinical guidelines<sup>3,9,57,58</sup> guide the delivery of care to women in the puerperium, primarily by PHC professionals, through comprehensive and coordinated care, valuing women's health needs, stimulating autonomy, self-care and care for their child. These guidelines are based on a high degree of scientific evidence and stand out for the quality of care delivery, which must be better investigated in the studies that address puerperal consultation and better implemented in the practice of providing care to women in the puerperium within PHC in different Brazilian and international settings.

HV is an important moment for the PHC team to detect early physical and emotional changes<sup>9</sup>, develop educational actions, identify household risks and vulnerabilities, establish a professional-user bond and improve the protection of women and children health in the post-partum period<sup>18</sup>.

Regarding the mentioned health care strategy, international studies have analyzed HV programs and their impacts, showing their importance for puerperal care. Brazilian studies are limited to investigating the frequency of visits and, incipiently, actions performed in HV, especially during the first week postpartum, and the main professional to perform this function is the community health worker, who also focuses on child and biologicist care.

With respect to breastfeeding, although it is an indicator of women's health in the postpartum period, studies still address the issue with greater emphasis on the child. This topic and the indicator number of postpartum consultations were the ones with most emphasis in Brazilian studies, with predominantly quantitative analysis, indicating a gap in investigations of the quality of care provided in PHC.

Breastfeeding benefits to women's health are countless<sup>19</sup> and the main difficulties in its maintenance occur in the first months postpartum, and PHC is an incentive environment for this practice<sup>41</sup>, considering its proximity to women and their priority role in the provision of puerperal care<sup>9</sup>.

PPD care identified in the papers analyzed was extensively investigated, especially in international studies. EPDS has emerged as an important tool for PPD screening by PHC professionals in developing countries to ensure early detection and appropriate therapeutic intervention in cases of PPD. National studies point to "empirical" PPD care, with professionals unprepared for screening, prevention and treatment of this condition 54-56.

PPD is an international phenomenon and the most common complication in the postpartum period. Viewed as a public health problem whose prevalence ranges from 10% to 15% in developed countries, reaching up to 40% in developing countries<sup>45,53,56</sup>, this condition affects women's quality of life and link with the newborn and its development<sup>53,54,56</sup>.

PHC health professionals are well positioned to provide psychosocial support to all women in the perinatal period and to perform preventive approaches among women who may be more likely to develop PPD or related disorders, particularly in the immediate postpartum period<sup>9,58</sup>. These professionals should play an active role in screening and selecting PPD treatment, considering contextual factors, such as culture, socioeconomic condition, among others<sup>9,58</sup>.

The limitations found for the accomplishment of this review referred to the wide range of

descriptors used, resulting in a large number of papers to perform the reading of titles and abstracts. However, this strategy was necessary, due to the scarcity of studies that use the postpartum period as a descriptor. This limitation was overcome by a thorough reading of titles and abstracts, ensuring selection of the studies that addressed the guiding question. Furthermore, a variety of research methods used to address the actions of puerperal programs was observed, which prevents a more accurate comparative analysis of the results achieved. As any type of study, this integrative review has advantages and limitations of the method itself, and care should be taken with regard to conclusions related to the findings. However, authors highlight the potential of the method used, since it has validity among experts in the review area.

#### Final considerations

Results indicate that there is a range of actions to be performed by PHC to assist women in the puerperium, which can be carried out using light and low-cost technologies, and that this point of care is paramount in helping to reduce of maternal morbimortality through counseling and support for recovery from pregnancy and birth, early identification and appropriate management of physical and emotional health needs.

Despite the recognized importance of puerperal care, Brazilian studies are mostly confined to investigating the number of postpartum visits, the number of home visits and the effect of breastfeeding programs, neglecting the comprehensive nature of postpartum care to women in PHC.

National and international studies indicate that postpartum care still focuses on newborn care and are mostly restricted to the immediate and late puerperium, and there is a need to improve the implementation of primary health care for women, especially in relation to the coordination and longitudinality of care, which evidences the need for better quality of care for puerperae in PHC.

It is noteworthy that PPD has been the target of countless studies in the international literature, given its high prevalence and public health issue, and evidenced the high potential of PHC professionals to act in the prevention, screening and treatment of said disease. In Brazil, this is a poorly studied topic worthy of attention of postpartum public policies, with results that point to the lack of qualification of PHC professionals for PPD care.

This review evidenced knowledge gaps regarding the subject matter, with the need for more robust studies that address comprehensive women care, as well as aspects of the quality of care provided in PHC. In addition, there is a need for evaluative research with a qualitative and quantitative approach in order to understand the implementation of puerperal care in PHC and the relationship of results found with the puerperal care program.

It is important to emphasize that the puerperium investigation can identify a range of activities to be developed and considered in PHC, both physical, material and human structure, as well as professional qualification, program planning and management, besides external factors cultural aspects of the woman receiving care. Thus, this study serves as a subsidy both to guide the elaboration and improvement of actions to the benefit of women in the puerperium in PHC by professionals and managers and to direct the elaboration of empirical studies that can investigate the integrality of puerperal care.

#### **Collaborations**

T Baratieri worked on the manuscript design, methodology, drafting and approval of the final version to be published. S Natal worked on manuscript design, methodology, critical review and approval of the final version.

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