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Evaluation of prenatal care process for habitual-risk pregnant women

Avaliação do processo na assistência pré-natal de gestantes com risco habitual
Evaluación del proceso en la atención prenatal de embarazadas con riesgo normal

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Descriptores

Atención prenatal; Indicadores de salud; Servicios de salud materna; Estudios de evaluación

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Abstract

Objective: Assess the quality of care in the prenatal care process for habitual-risk pregnant women.

Methods: Evaluation research, undertaken between May 2015 and January 2016 at the Natural Birth Center (CPN) Lúgia Barros Costa in Fortaleza, Ceará. The sample consisted of 560 histories of pregnant women who received prenatal care at the CPN. The data collection instrument included sociodemographic, clinical and obstetric aspects, as well as process indicators of prenatal care. The criteria adopted to assess the process were the prenatal care quality indicators. The data were stored and processed in Statistical Package for the Social Sciences version 20.0. Descriptive statistical analysis was applied.

Results: As for the prenatal care quality indicators, 42.3% (n=237) complied with the appropriate number of appointments, have attended seven or more. Only 26.3% (n=147) started prenatal care early. Regarding the quality indicators of the clinical and obstetric procedures, it was verified that 55% (n=309) was appropriate. When the quality indicators were analyzed for the laboratory tests, only 25.4% (n=142) were appropriate.

Conclusion: The quality of prenatal care is appropriate in a minority of the study population. Managers and professional should pay greater attention to the planning of actions to improve the indicators, related to the number of appointments, early start of prenatal care, clinical and obstetric procedures and execution of laboratory tests.

Resumo

Objetivo: Avaliar a qualidade do cuidado quanto ao processo no pré-natal de gestantes com risco habitual.

Métodos: Pesquisa avaliativa, realizada no período de maio de 2015 a janeiro de 2016, na Casa de Parto Natural (CPN) Lúgia Barros Costa em Fortaleza, Ceará. A amostra totalizou 560 prontuários de gestantes que realizaram pré-natal na CPN. O instrumento de coleta dos dados contemplou aspectos sociodemográficos, clínicos e obstétricos, e indicadores de processo de assistência pré-natal. Os critérios adotados para avaliar o processo foram os indicadores de qualidade do pré-natal. Os dados foram armazenados e processados no programa estatístico *Statistical Package for the Social Sciences* versão 20.0. A análise utilizou a estatística descritiva.

Resultados: Quanto aos indicadores de qualidade do pré-natal, observou-se que 42,3% (n=237) atenderam ao número adequado de consultas, realizando sete ou mais consultas. Apenas 26,3% (n=147) iniciaram precocemente o pré-natal. Referente aos indicadores de qualidade dos procedimentos clínicos e obstétricos verificou-se que 55% (n=309) estava adequado. Quando analisados os indicadores de qualidade referentes aos exames laboratoriais, apenas 25,4% (n=142) estavam adequados.

Conclusão: Conclui-se que a qualidade do pré-natal é adequada na minoria da população estudada, devendo existir maior atenção de gestores e profissionais para o planejamento de ações em prol da melhoria dos indicadores relacionados aos números de consultas, início precoce do pré-natal, procedimentos clínicos e obstétricos e realização dos exames laboratoriais.

Resumen

Objetivo: Evaluar calidad del cuidado respecto del proceso en el prenatal de embarazadas con riesgo normal.

Métodos: Investigación evaluativa, realizada de mayo 2015 a enero 2016, en la Casa de Parto Natural (CPN) Lúgia Barros Costa en Fortaleza, Ceará. Muestra totalizando 560 historias clínicas de embarazadas que realizaron prenatal en la CPN. El instrumento de recolección de datos contempló aspectos sociodemográficos, clínicos y obstétricos, e indicadores de proceso de atención prenatal. Los criterios adoptados para evaluar el proceso fueron los indicadores de calidad del prenatal. Datos almacenados en programa estadístico *Statistical Package for the Social Sciences* versión 20.0. Análisis realizado mediante estadística descriptiva.

Resultados: Respecto a los indicadores de calidad del prenatal, se observó que 42,3% (n=237) respondieron al número adecuado de consultas, realizando siete o más. Solamente 26,3% (n=147) iniciaron precozmente el prenatal. Respecto a indicadores de calidad referentes a exámenes laboratoriales, solamente 25,4% (n=142) resultaron adecuados.

Conclusión: Se concluye en que la calidad del prenatal es adecuada en la minoría de la población estudiada, debiendo brindársele mayor atención de gestores y profesionales al planeamiento de acciones en pro de la mejora de los indicadores relativos al número de consultas, inicio precoz del prenatal, procedimientos clínicos y obstétricos y realización de exámenes laboratoriales.

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Introduction

Women's Health care during pregnancy and postpartum represents a challenge for health authorities around the world regarding the quality of care provided and conceptual frameworks. The pregnancy cycle needs to be monitored satisfactorily in its three phases: pregnancy, childbirth and postpartum, so that the woman receives comprehensive and high-quality care.

In Brazil, prenatal monitoring (PN) aims to ensure the development of the pregnancy, favoring a healthy birth, with the least possible negative impact on maternal and fetal health, mainly addressing psychosocial aspects, educational and preventive activities.⁽¹⁾

In that sense, Brazilian studies show that the health levels of mothers and unborn babies are closely intertwined with the quality of PN care, with a direct correlation between appropriate PN and lower maternal and perinatal morbidity and mortality rates.⁽²⁻⁴⁾ Thus, the importance of managers and professionals' implementation of strategies is underlined with a view to guaranteeing access to health, as well as the quality of the service provided.

Over the last three decades, studies on the quality of health services have been based on one or more categories proposed by Donabedian (1991), who defines the quality of health services as health services' extent of accommodation of the population's needs, expectations and care standard.⁽⁵⁾

According to Donabedian (1988, 1991),^(5,6) information, from which conclusions can be drawn on the quality of care, need to be based on three components of health care: structure, process and outcome analysis. The process corresponds to the activities developed in the relationship between professionals and patients, according to technical-scientific standards, as well as activities related to the use of resources in their quantitative-qualitative aspects, including the recognition of problems, diagnostic methods, diagnoses and care provided.

The same author still considers that the evaluation of the process is a fundamental component to investigate the quality of care. Therefore, through the application of quality criteria to evaluate the PN

care process, service performance and care quality evidenced can be identified, which is one of the conditions to guarantee the effectiveness of care to pregnant women.^(5,6)

The objective was therefore to evaluate the quality of care regarding the process offered to habitual-risk pregnant women.

Methods

Evaluation study, carried out from May 2015 to January 2016, at the Natural Birth Center Ligia Barros Costa (CPN), which is part of the Pro-Rectorry of Community Services at *Universidade Federal do Ceará* (UFC).

The evaluation consisted of the analysis of all medical records as from January 2011, a period corresponding to the formulation of the Stork Network Strategy, until June 2015, during which 695 medical records were found.

The inclusion criteria were the files of women who received prenatal care at CPN and medical records in the archives sector. The exclusion criteria adopted were: files of women in PN monitoring at the time of data collection (56), who were referred to high-risk PN (21), and for whom only one consultation was registered (24). Therefore, the sample totaled 560 files.

In order to evaluate the process, Coutinho (2010) proposed: prenatal care indicators, clinical and obstetric evaluation indicators and complementary test indicators.⁽⁷⁾

Regarding the prenatal indicators, compliance is considered as having started within 12 weeks of pregnancy and women who had seven or more appointments. Non-compliance is considered when the PN started after the 27th week of pregnancy or the woman had two or less visits. The quality of PN is considered intermediate when situations between compliant and non-compliant are present. It is emphasized that the criterion was adapted, adopting, instead of six appointments and start of PN up to 14 weeks of pregnancy, seven consultations and start of PN up to 12 weeks of gestational age (GI), following the recommendation of the Stork Network Strategy.⁽⁸⁾

Regarding the indicators related to clinical and obstetric procedures, compliance is considered when there were five or more records of uterine height (UH), GI, weight, blood pressure (BP) and Body Mass Index (BMI); and four or more records of Fetal Heart Rate (FHR); and two or more records of fetal presentation and edema; Non-compliance: two or less records of UH, GI, BP, edema, weight and FHR, or no record of fetal presentation; and Intermediary: all intermediary situations between compliance and non-compliance.

Regarding the quality indicators for the complementary tests, the toxoplasmosis and HBsAg tests recommended by the Stork Network Strategy were evaluated, but the number of one serum test was adopted for each, according to a study carried out in 2012.^(8,9) Compliance was considered when the pregnant woman underwent an ABO-Rh typing, two hematocrit, two hemoglobin, two fasting glucose, two VDRL, two anti-HIV tests, two type I urine, one HBsAg and one serology for toxoplasmosis throughout the prenatal period. Non-compliance was considered when there was no record of laboratory tests; and intermediary when any basic test was performed, regardless of the type.

In order to enhance the credibility of the collection instrument, three expert judges performed a face and content evaluation.

Data were stored and processed in the Statistical Package for the Social Sciences (SPSS), version 20.0. Absolute, relative frequencies and central trend measures were calculated. The results were presented in the form of tables and discussed according to relevant literature.

The ethical principles for research involving human beings present in Brazilian National Health Council Resolution 466/12 were respected. This study received approval under protocol 1.292.616.

Results

The first quality indicators presented refer to the number of appointments and the gestational age at the start of prenatal care, as shown in table 1.

Table 1. Prenatal care characteristics of pregnant women attended in Habitual-Risk Prenatal Care

| Prenatal Care | n(%) | Median \pm SD |
|--|-----------|-----------------|
| No. of Appointments (n=560) | | |
| 2 – 3 | 155(27.7) | 6.00 \pm 2.82 |
| 4 – 6 | 168(30.0) | Min.: 2 |
| \geq 07 | 237(42.3) | Max.: 14 |
| Early start of PN (n=560) | | |
| \leq 12 weeks | 147(26.3) | |
| > 12 weeks | 413(73.8) | |
| Start term of PN (n=560) | | |
| 1 st Term (8 – 14 weeks) | 209(37.3) | |
| 2nd Term (15 – 27 weeks) | 296(52.9) | |
| 3 rd Term (> 27 weeks) | 55(9.8) | |
| Exit Term from PN (n=560) | | |
| 1 st Term (8 – 14 weeks) | 5(0.9) | |
| 2nd Term (15 – 27 weeks) | 76(13.6) | |
| 3 rd Term (> 27 weeks) | 479(85.5) | |
| Final Appointment \geq 37 weeks (n= 479) | | |
| Yes | 283(50.5) | |
| No | 277(49.5) | |
| Compliance of PN as to 7 or more appointments | | |
| Compliant | 237(42.3) | |
| Intermediary | 168(30.0) | |
| Non-compliant | 155(27.7) | |
| Compliance of PN as to early start of appointments | | |
| Compliant | 147(26.3) | |
| Intermediary | 349(62.3) | |
| Non-compliant | 64(11.4) | |

In this study, the mean number of PN appointments was 5.83 (median 6.00). Most pregnant women, 73.8% (n=413) started PN after the 12th week of pregnancy, with the highest prevalence of the start of PN monitoring occurring in the 2nd term of pregnancy in 52.9% (n=296). When the compliance of PN with seven or more appointments was analyzed, it was observed that little less than half (42.3%) took part in seven or more appointments, being considered compliant. What the early start of the consultations is concerned, only 26.3% (n=147) were considered compliant.

Table 2, the data on the quality indicators of the clinical and obstetric procedures offered to the pregnant women at the CPN are displayed.

Considering the clinical and obstetric procedure, compliance was observed in 309 (55%) cases of prenatal care that took place at the service analyzed. Despite the prevalence of favorable outcomes, the number of prenatal care cases with a smaller number of records in the files cannot be ignored.

Table 3, the compliance with the complementary tests the pregnant women attended at the CPN can be observed.

Table 2. Clinical and obstetric procedures offered to pregnant women attended in Habitual-Risk Prenatal Care

| Obstetric Clinical Procedures | n(%) |
|---|-----------|
| Two fetal presentation records | |
| Yes | 510(91.1) |
| No | 45(8.0) |
| Not informed | 5(0.9) |
| Five records of gestational age calculation | |
| Yes | 353(63.0) |
| No | 204(36.5) |
| Not informed | 3(0.5) |
| Five records of UH evaluation | |
| Yes | 343(61.3) |
| No | 215(38.4) |
| Not informed | 2(0.3) |
| Five records of BP verification | |
| Yes | 345(61.6) |
| No | 210(37.5) |
| Not informed | 5(0.9) |
| Four records of FHR auscultation | |
| Yes | 392(70.0) |
| No | 166(29.7) |
| Not informed | 2(0.3) |
| Five records of weight/BMI evaluation | |
| Yes | 340(60.7) |
| No | 216(38.6) |
| Not informed | 4(0.7) |
| Two records of edema evaluation | |
| Yes | 517(92.3) |
| No | 40(7.2) |
| Not informed | 3(0.5) |
| Anti-tetanus vaccination (n=439) | |
| None | 59(10.5) |
| Only 1 dose | 267(44.7) |
| ≥ 2 doses | 113(20.1) |
| Not informed | 21(21.7) |
| Compliance of clinical and obstetric procedures | |
| Compliant | 309(55.0) |
| Intermediary | 112(20.0) |
| Non-compliant | 140(25.0) |

When assessing compliance with the complementary tests, it was observed that most of the pregnant women did not perform the tests as recommended by the Federal Health Department. A percentage of 25.4% (n = 142) had performed all complementary tests considered appropriate in the study, namely: an ABO-Rh typing, two hematocrit, two hemoglobin, two fasting glucose, two VDRL, two anti-HIV tests, two urine tests, one HbsAg and one serology for toxoplasmosis.

Analyzing the table above, it was observed that only three of them showed compliance superior to 50%. These were: blood typing / Rh factor (90%), HbsAg (65.9%) and Toxoplasmosis (76.6%). These were the only tests considered compliant with only one test taken.

Table 3. Compliance with complementary tests by pregnant women in Habitual-Risk Prenatal Care

| Test details | n(%) |
|-------------------------------------|-----------|
| ABO-Rh* | |
| Compliant | 504(90.0) |
| Non-compliant | 56(10.0) |
| Hb/Ht | |
| Compliant | 189(33.8) |
| Non-compliant | 345(61.6) |
| Not informed | 26(4.6) |
| Fasting glucose | |
| Compliant | 179(32.0) |
| Non-compliant | 325(58.0) |
| Not informed | 56(10.0) |
| VDRL | |
| Compliant | 203(36.2) |
| Non-compliant | 240(42.9) |
| Not informed | 117(20.9) |
| HIV | |
| Compliant | 173(30.9) |
| Non-compliant | 253(45.2) |
| Not informed | 134(23.9) |
| Urine type I | |
| Compliant | 193(34.4) |
| Non-compliant | 319(57.0) |
| Not informed | 48(8.6) |
| HBsAg* | |
| Compliant | 369(65.9) |
| Not informed | 191(34.1) |
| Toxoplasmosis* | |
| Compliant | 429(76.6) |
| Not informed | 131(23.4) |
| Compliance with complementary tests | |
| Compliant | 142(25.4) |
| Intermediary | 208(37.1) |
| Non-compliant | 210(37.5) |

*Considered compliant when only one test was taken

Discussion

The limitations of the study are related to the use of secondary sources (process evaluation), due to the under-registration, which affects the generalization power of the results.

Nevertheless, the results help nurses and health managers by presenting the weak points in the prenatal care offered, considering the components of the process, and can support decision making in order to formulate coping strategies for problems that affect the quality of care for women during this period. It is also worth noting that it is an innovative study, as it intended to verify the compliance of the prenatal process, in the framework of the Stork Network, a recent policy that brings valuable contributions to the Brazilian midwifery context.

It was observed that 147 (26.3%) pregnant women started PN care until the 12th week of pregnancy and 237 (42.3%) had seven or more PN visits. In a cohort study carried out in São Luiz / MA, considering the content of PN care, it was evidenced that the main damage was related to the small number of GI consultations, indicating the importance of surveillance at the end of pregnancy to identify risk situations and guarantee specific interventions.⁽¹⁰⁾

These results may have different determinants though, related to the characteristics of pregnant women regarding the difficulty to diagnose the pregnancy and access barriers.⁽²⁾ In the service evaluated, there is a lack of a support network, especially of Community Health Agents (CHA) who recruit these women early. In addition, the pregnant woman only initiates the PN consultation and the opening of the medical record through the test results, in order to identify whether or not there is a need for referral to high-risk PN. These aspects may hinder the early start of PN monitoring.

The implementation of high-quality PN includes the early recruitment of pregnant women to start specialized care. The Federal Health Department (2012) stresses the importance of starting within 12 weeks, which was not achieved in the study.⁽¹¹⁾

Another worrying finding is related to the high proportion of women, 296 (52.9%), starting PN in the second term, contributing to a reduction in the period of care and a consequent increase in maternal and infant morbidity and mortality. These data reveal difficulty in accessing PN, as evidenced in earlier studies.^(12,13)

The *Nascer Brasil* survey points out that the main barriers for compliance with PN or for the early start of monitoring are related to the persisting social inequalities in the country, with lower access of indigenous and black women, those with lower levels of education, more pregnancies and resident in the North and Northeast.⁽²⁾

It is also noticed that some professionals do not record the data of the pregnant women equally in both sources (pregnant woman's card and institutional charts). Comparing the number of PN consultations recorded in the medical records and col-

lected on the pregnant women's cards revealed more consultations registered on the latter, which can contribute to erroneous evidence of low PN quality coverage in existing studies.⁽¹⁴⁾

It is also important to evaluate not only the GI at which the woman started PN, but also the GI at exit. In this study, the GI of the last visit was considered as the exit date. Thus, only 283 (42.5%) performed the last visit at 37 weeks or more, the mean GI of pregnant women considered ideal for the final care visit.⁽¹⁵⁾

It can be inferred from the results obtained that the late onset of PN and the inappropriate number of consultations contribute, among other factors, to an unfavorable outcome, as the accomplishment of this procedure is essential for the early discovery of situations that put maternal and fetal health at risk.⁽⁹⁾

Regarding clinical and obstetrical procedures, the cut-off point with two or more fetal presentation records was considered appropriate, in line with a cross-sectional study performed in Santa Maria/RS.⁽⁷⁾ Such a parameter is followed because the fetal presentation is more easily identified as from the third term of pregnancy.⁽¹⁶⁾

Studies consider PN care as compliant when there are more than five records of GI. These surveys present a prevalence of 67%, 71.5% and 79.7% of compliant GI records in their findings.^(7,9,13) These findings are similar to those found in this study, which obtained 63% of records. Calculating the GI during PN is an essential tool to evaluate fetal growth and wellbeing, providing parameters that indicate developmental changes.⁽¹³⁾

Regarding the UH measures, a procedure indicated as from the 12th week of pregnancy, with the purpose of assessing fetal growth as well as changes that may occur during this period,⁽¹⁷⁾ it is noted that some authors differ on the number of records, considering compliance when this variable was registered in six or more or in five or more consultations.^(7,18) These studies found a prevalence of 85.1% and 83.3%, respectively. In this study, the prevalence of the compliance of this record was 61.5%, being lower than that verified in the aforementioned studies.

A cross-sectional study carried out with 1,947 pregnant women's cards, aiming to evaluate the

compliance and prenatal monitoring of pregnant women with arterial hypertension and with habitual risk, considered BP records in all prenatal consultations as compliant, showing a prevalence of 95% compliance in its sample.⁽¹⁹⁾

Another study, in turn, considered five or more BP records as compliant, verifying compliance in 83.9% of the sample. In this study, using the same parameters, compliance was found in 62.2% of the sample, lower than the level verified in the above study. This result may have been influenced by the under-registration of this information in the medical records, as well as by the percentage of women who took part in at least five consultations.⁽⁷⁾

Regarding the auscultation of FHR, a fundamental procedure for the evaluation of fetal vitality, the research used as a reference considered four or more records as compliant, with a prevalence rate of 86.7%, a finding superior to that found in the present study, which evidenced 70.3% of compliance in the sample records.⁽⁷⁾

Another important parameter is the measuring of the pregnant woman's weight. It is known that obesity is associated with a higher frequency of dystocia, diabetes and hypertension, and a higher risk of cesarean section. On the other hand, in low-weight pregnant women, there is an increased risk of preterm birth.^(1,20)

Studies consider that weight verification should be performed in all PN visits or in five or more visits.^(7,9,12) In this study, using five or more records as a parameter of compliance, the prevalence was 61.2%, inferior to the rates found in the studies cited, with 96.3%, 83.5% and 71%.

Regarding the record about the presence of edema, it was observed that 92.3% of the files contained at least two records. Despite the low valuation and underreporting of this variable,⁽²¹⁾ in this study, the results were good regarding the recording of this aspect.

Although the evaluation of edema was removed from the diagnostic triad of preeclampsia, this signal remains an important parameter to be evaluated, especially when there is a sudden increase in weight that may be related to increased blood pressure and renal failure.⁽²²⁾

Tetanus immunization is a requirement of the Federal Health Department, and the pregnant woman has to receive the complete regimen or at least two doses of the vaccine. In this study, only 113 (25.6%) pregnant women received two or more doses. Like in the present study, in a survey that evaluated the vaccination coverage of 151 pregnant women enrolled in the Family Health Strategy in the South of Montes Claros / MG, important gaps were shown in the vaccination coverage of this population, in which 40.4% did not receive the vaccination schedule. Other studies present a similar reality in Rio de Janeiro, which points to the need to develop strategies aimed at improving coverage against neonatal tetanus.^(23,24)

Another worrying factor, verified in this study, is the underreporting of clinical and obstetrical records. Registration is a way to ensure care continuity, serving as a parameter for the clinical and diagnostic evolution of care, as well as being a secondary source for research, which will foster knowledge about the reality.

The performance of laboratory tests during the prenatal period is relevant, as it permits more specific and detailed monitoring of the pregnant woman's health conditions.⁽¹⁾

Laboratory tests should be requested at the first visit, being executed during the first trimester of pregnancy; and VDRL, HIV, urine type 1, glucose and complete blood count should be repeated in the third trimester. It is observed, however, that the primary concern is related to the recording of results, and not to the pregnancy period when the test was offered or performed.⁽¹⁾

As for routine exams, Brazilian protocols recommend two serum tests for syphilis and HIV, as well as the repetition of blood and urine tests. For the control of syphilis and HIV, serum screening for syphilis and HIV is recommended for more than 90% of pregnant women. Based on these parameters, it is observed that most of the pregnant women did not perform the laboratory tests appropriately.⁽²⁵⁾

Failure to perform these tests is directly related to high rates of vertical transmission of syphilis and HIV infection and the occurrence of preventable perinatal deaths, appointing problems in the quality of care provided.^(26,27)

In view of the above results, it can be inferred that there is a considerable number of women with medical records without notes and uncompleted monitoring cards. In addition, only the tests that were considered compliant if performed only once (blood typing / Rh Factor, toxoplasmosis and HBsAg) revealed compliance rates superior to 50%. Hence, the results could be different if compliance corresponded to the accomplishment of only one test during the pregnancy.

In view of this implication, there are some factors that may explain that the women underwent the tests only once during pregnancy, such as: difficulty in accessing laboratories in the public network, long waiting time for the release of reports and the late start of PN, delaying the request for tests.

Studies indicate that the evaluation of the prenatal care process contributes to the improvement of service quality, as well as to the reduction of maternal and perinatal morbidity and mortality rates.⁽¹⁴⁾

Thus, the evaluation of the process should not consider prenatal quality only based on the number of visits or the gestational age at the start of PN monitoring, but also compliance with the content of the care offered.

There is still no consensus on the minimum behaviors health professionals should adopt during care for women in the pregnancy and postpartum cycle. In this study, the recommendations of the Stork Network Strategy were followed though, to perform seven or more consultations for a full-term pregnancy, with the start of follow-up within 12 weeks, clinical and obstetric procedures and laboratory tests.⁽⁸⁾

In addition, the results reported here show that, despite the increase in prenatal care coverage in the country, few women receive appropriate care, according to the minimum procedures recommended by the Federal Health Department, with similar results being found in earlier studies.^(2,12,14)

Regarding the analysis of prenatal quality, comparisons with other studies should be made with caution. As with the findings of the current study, other studies have observed differences in the classification of prenatal care according to the index used. This is justified because the indices use different algorithms to define their prenatal compliance

categories. Such differences may result in different conclusions about the actual prenatal situation, leading to misinterpretations.⁽²⁸⁾

Conclusion

The evaluation of the process evidenced low compliance of PN regarding the start of PN monitoring, number of consultations during pregnancy, clinical and obstetric procedures and laboratory tests recommended by the Federal Health Department. Therefore, the compliance level of the process in this service needs to be planned for the sake of meeting the quality indicators. It is concluded that there is a need to improve care regarding the process indicators in the service. Managers and health professionals should pay further attention to this, including investment in training and action planning to improve these indicators. In addition, a monitoring program needs to be implemented for the evaluation of prenatal care, in order to guarantee the effectiveness of the actions and the quality of care.

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Collaborations

Balsells MMD, Oliveira TMF, Bernardo EBR, Aquino PS, Damasceno AKD, Castro RCMB, Lessa PRA and Pinheiro AKB contributed to the project design, data analysis and interpretation, relevant critical review of the intellectual content and approval of the final version for publication.

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