Revista Científica Escola de Saúde Pública do Ceará Paulo Marcelo Martins Rodrigues
1808-7329 (1809-0893)

ORIGINAL ARTICLE
Public / Collective Health

EVALUATION OF PROFESSIONAL PRENATAL CARE RECORDS IN ELECTRONIC MEDICAL RECORDS IN A CITY IN CEARÁ

AVALIAÇÃO DOS REGISTROS PROFISSIONAIS DA ASSISTÊNCIA PRÉ-NATAL EM PRONTUÁRIOS ELETRÔNICOS EM UM MUNICÍPIO CEARENSE

EVALUACIÓN DE REGISTROS PROFESIONALES DE ATENCIÓN PRENATAL EN HISTORIAS CLÍNICAS ELECTRÓNICAS EN UNA CIUDAD DE CEARÁ

Ana Karoline Lima de Oliveira[1], *Maria da Paz Castelo Lins*[2], *Adelina Feitosa Leopoldo*[3], *Denilson Ribeiro Dimas*[4], *Talyta Alves Chaves Lima*[5], *Marilene Alves Oliveira Guanabara*[6] *e* *Lucília Maria Nunes Falcão*[7]

ABSTRACT
To evaluate professional records of prenatal care in electronic medical records in a city in Ceará. Retrospective, cross-sectional, and descriptive study, carried out through the analysis of medical records of pregnant women followed up at a Family Health Unit during the period from January 2021 to December 2022. The data collec-tion instrument contains sociodemographic information, obstetric history and care. The data were analyzed based on absolute and relative frequencies. The percentage of suitability of consultations decreased as more cri-teria were used to assess quality, at level 1 it presented 73.1% suitability, at level 2 57.7%, at level 3 53.8% and at level 4 50.0%. Prenatal care was in compliance with Ministry of Health guidelines. However, weaknesses were identified in the patients' electronic medical records, especially related to sociodemographic information.
Keywords: *Health Evaluation; Prenatal Care; Quality of Health Care.*

RESUMO
Avaliar os registros profissionais da assistência pré-natal em prontuários eletrônicos em um município cearense. Estudo retrospectivo, transversal, e descritivo, realizado por meio da análise dos prontuários de gestantes acompanhadas em uma Unidade de Saúde da Família durante o período de janeiro de 2021 a dezembro de 2022. O instrumento de coleta de dados contém informações sociodemográficas, do histórico obstétrico e sobre a assistência. Os dados foram analisados a partir de frequências absolutas e relativas. O percentual de adequabilidade das consultas foi diminuindo ao passo que mais critérios eram utilizados para a avaliação da qualidade, no nível 1 apresentou 73,1% de adequabilidade, no nível 2 57,7%, no nível 3 53,8% e no nível 4 50,0%. A assistência pré-natal, mostrou-se em conformidade com as diretrizes do Ministério da Saúde. No entanto, foram identificadas fragilidades nos registros dos prontuários eletrônicos das pacientes, relacionadas especialmente às informações sociodemográficas.
Descritores: *Avaliação em saúde; Cuidado pré-natal; Qualidade da assistência à saúde*.

RESUMEN
Evaluar los registros profesionales de atención prenatal en historias clínicas electrónicas en una ciudad de Ceará. Estudio retrospectivo, transversal y descriptivo, realizado mediante el análisis de historias clínicas de gestantes seguidas en una Unidad de Salud de la Familia durante el período de enero de 2021 a diciembre de 2022. El instrumento de recolección de datos contiene información sociodemográfica, antecedentes obstétricos. y cuidado. Los datos se analizaron en base a frecuencias absolutas y relativas. El porcentaje de idoneidad de las consultas disminuyó a medida que se utilizaron más criterios para evaluar la calidad, en el nivel 1 presentó un 73,1% de idoneidad, en el nivel 2 un 57,7%, en el nivel 3 un 53,8% y en el nivel 4 un 50,0%. La atención prenatal cumplió con las directrices del Ministerio de Salud, sin embargo, se identificaron debilidades en los registros médicos electrónicos de los pacientes, especialmente relacionados con la información sociodemográfica.
Descriptores: *Evaluación en Salud; Atención Prenatal; Calidad de la Atención de Salud.*

[1] Escola de Saúde Pública do Ceará, Fortaleza/CE - Brasil.
[2] Escola de Saúde Pública do Ceará, Fortaleza/CE - Brasil.
[3] Escola de Saúde Pública do Ceará, Fortaleza/CE - Brasil.
[4] Escola de Saúde Pública do Ceará, Fortaleza/CE - Brasil.
[5] Secretaria da Saúde do Estado do Ceará, Fortaleza/CE - Brasil.
[6] Universidade de Fortaleza, Fortaleza/CE - Brasil.
[7] Secretaria da Saúde do Estado do Ceará, Fortaleza/CE - Brasil.

INTRODUCTION

The care provided during pregnancy, called prenatal care, includes care ranging from health education actions, including risk identification, prevention and even treatment of complications and injuries. To this end, it requires adequate planning to ensure, in addition to access, the continuity of care with effective comprehensiveness of care[1].

In this context, the Ministry of Health provides a series of procedures to be adopted by health professionals in favor of maternal and childcare, organized in the low-risk prenatal guideline, which involves clinical and laboratory tests, measurement of vital signs, blood pressure, weight, gestational age, uterine height recordings, assessment of fetal vitality with auscultation of fetal heartbeats (BCF) and fetal movements[2].

Prenatal care classified as usual risk or low risk is one of the main programmatic actions carried out in Primary Health Care (PHC). The entire context of women's health care is influenced by the social, economic and cultural environment in which pregnant women live, which should be considered for continuous and quality care, with humanized care for pregnancy[3].

In 2021, about 24.3% of the 36,877 preventable infant and neonatal deaths that occurred in the country were related to inadequate care during pregnancy. And, in 2019, 1,576 maternal deaths were reported to the Mortality Information System, representing 58 maternal deaths for every 100,000 live births[4]. It is worth noting that the high rates of infant and maternal mortality, with significant disparities in the country, reinforce the existence of failures in the care provided[5,6].

Actions performed inappropriately or negligently are associated with consequences such as: prematurity and low birth weight, increased risk of fetal and maternal death, hospitalizations in intensive care units, postpartum depression and anxiety, and successive pregnancies in a short period of time[7].

One of the quality indicators, the start of prenatal care in the first trimester of pregnancy, contributes to ensuring a smooth evolution during pregnancy, making it possible to identify risk situations as early as possible, preventing complications of pregnancy and the puerperal cycle[8,9].

All consultations performed during the consultation should be recorded in the pregnant woman's medical record by all responsible professionals. The health unit that has an electronic record system offers the possibility of managing data on the health of a population group in a much faster and more appropriate way. The information collected allows the monitoring of care actions and feeds the panel of indicators necessary for the management of the health condition[10].

Recording instruments are tools that allow effective intercommunication between professionals throughout pregnancy. In this sense, the legibility and completeness of these records are essential[11].

The medical record is a fundamental document for comprehensive and continuous patient care, built collaboratively in the face of information recorded by the entire team[12]. The clinical record of the pregnancy-puerperal cycle should include the minimum prenatal follow-up data, such as gestational age at uptake, number of consultations and exams and procedures performed[10].

The e-SUS Primary Care Strategy (e-SUS PHC), established in 2013, comprises a set of initiatives aimed at the computerization of PHC[13]. The implementation of the citizen's electronic medical record (PEC) in health services presents improvements in disease surveillance and monitoring systems, support for decision-making and improvement in the management of patients' health information, in addition to enabling professionals to have a deeper understanding of the user, including their clinical conditions, family, social context and history of care[14].

The institutionalization of the evaluation of prenatal care is an essential strategy for improving the quality of care, since it is capable of identifying and developing subsidies for raising awareness and coping with failures, thus making it possible to review public policies in order to respond more adequately and resolutely to the needs of this population[15].

From this perspective, the evaluation of health actions carried out with pregnant women during prenatal care is valuable to estimate the comprehensiveness of care and, thus, its quality, characterizing it as a powerful guiding tool for health managers and professionals[16].

The relevance of this study is justified by the importance of evaluating whether the parameters established by the Ministry of Health for quality care for pregnant women are in force in clinical practice, since, in possession of these results, it is possible to insert new discussions and reflections on alternatives that contribute to the improvement of health care during the pregnancy period. aiming at positive repercussions during pregnancy, childbirth and puerperium. Thus, the objective of this study is to evaluate the professional records of prenatal care in electronic medical records in a municipality in the state of Ceará.

METHODS

This is a retrospective, cross-sectional study with a descriptive approach, carried out through the analysis of the medical records of the research subjects. All pregnant women followed up at a Family Health Unit (FHU) in the municipality of Tauá-CE, during the period from January 2021 to December 2022, participated in the research.

The municipality of Tauá, located in Ceará, 345 km from the state capital, Fortaleza, has an area of 4,010.618 km² and 55,716 inhabitants, according to the 2010 census. Today, it has FHS coverage of 100% of the city's population. According to data obtained from the e-SUS Primary Care information system, currently, the number of women of childbearing age in the entire territory covered by the municipality is 17,161, of pregnant women is 436 women and the number of prenatal consultations carried out in 2022 was 5,738,117.

The FHU of choice has two Family Health Strategies (FHS) with two Family Health Teams (FHTs) and a total of 13 Community Health Agents (CHA). During the period established for data collection, a total of 211 pregnant women were treated, of which 111 belonged to FHS I and 100 pregnant women to FHS II.

The inclusion criteria considered pregnant women attended exclusively at the FHS, whose prenatal care started from 01/01/2021 and ended until 12/31/2022, with the outcome of the pregnancy being: delivery with or without complications of live birth,

classified as usual risk with or without vulnerabilities, according to the classification of the Ministry of Health. Pregnant women who received prenatal care in the private health network, pregnant women who suffered abortion during the study period, and whose prenatal care was classified as high risk, were excluded from data collection and analysis.

To fill out the data collection instrument, the Citizen's Electronic Medical Record (PEC) was accessed, available through e-SUS AP, based on a report generated with pregnant women who received prenatal care in the established period, and only the records of care that were identified as prenatal care were evaluated.

Of the 211 pregnant women analyzed, 108 received care outside the period established by the study or did not have their pregnancies terminated with an outcome in the system, remaining as active pregnancies, 46 were stratified as high risk, 5 were from territories outside the scope of the FHS, and 26 pregnant women were excluded from the sample for other reasons, such as: pregnancy outcome with abortion, inclusion of the condition of pregnant woman by mistake, received prenatal care in the private health network, or no records were found in the system. Therefore, only 26 women who met the established criteria remained to be analyzed.

A form based on the modified Kessner Index18 was developed, including the variables of the index and associating them with the variables extracted from the low-risk prenatal guideline[2]. The data collection instrument contains sociodemographic data, data on current pregnancy, and information on the care received. The sociodemographic, clinical, and evaluative data obtained were tabulated using the *Statistical Package for the Social Sciences* (SPSS), version 20.0, and analyzed based on absolute and relative frequencies.

Applying the guidelines of the Ministry of Health[2], and according to a study[19] that used the modified Kessner Index as a methodological basis[15], the analysis of the completed instruments and the main outcome of the study, quality of prenatal care, were obtained according to four levels of quality:

Level 1: Classifies quality into three categories: adequate (when 6 or more consultations are recorded and prenatal care is started before 12 weeks of gestation); inadequate (when the start of prenatal care after 28 weeks of gestation, or less than three visits); intermediate (in other situations);

Level 2: quality of prenatal care assessed by the number of visits, gestational age at the first prenatal visit, and clinical procedures (level 1 + level 2). Categories: adequate (when six or more consultations are recorded, prenatal care begins before 12 weeks of gestation, and five or more records of each of the following procedures: blood pressure, weight, gestational age, uterine height records, and four or more records of fetal heartbeat (BCF) and fetal movements); inadequate (when the beginning of prenatal care after 28 weeks of gestation is recorded, or less than three consultations, two or fewer records of the procedures); intermediate (in other situations).

Level 3: quality of prenatal care assessed by the number of consultations, initiation of prenatal care and laboratory tests (level 1 + level 3). Categories: adequate (when six or more consultations are recorded, prenatal care started before 12 weeks of gestation, and a record of the tests: obstetric ultrasonography, blood typing and Rh factor, hemoglobia (Hb)/hematocrit (Ht) dosage, fasting blood glucose, Rapid test for syphilis

and/or VDRL, rapid test for HIV and/or anti-HIV, HbsAg, Toxoplasmosis (IgG and IgM) and urinalysis (EAS), and the following, at the beginning of the third gestational trimester: Hb/Ht dosage, Rapid test for syphilis and/or VDRL, Rapid test for HIV and/or anti-HIV, HbsAg, Toxoplasmosis (IgM), blood glucose and EAS; inadequate (when the start of prenatal care after 28 weeks or less than three consultations and no record of the exams was recorded); intermediate (in all other situations).

Level 4: quality of prenatal care assessed by the number of consultations, start of prenatal care, procedures performed during prenatal care, and laboratory tests (level 1 + level 2 + level 3). Categories: adequate (six or more prenatal consultations and prenatal care before 12 weeks, five or more records of clinical procedures and the recommended exams in the 1st and 3rd trimesters; inadequate (start of prenatal care after 28 weeks, or less than three visits, two or fewer records of clinical procedures and no records of exams); intermediate (in other situations).

This study was carried out after approval by the Research Ethics Committee of the School of Public Health of Ceará - ESP/CE, with approval opinion No. 5,991,509, in 2023.

RESULTS

A total of 26 registered patients who receive prenatal care in the city of Tauá-CE, in the FHS Area 1 and 2, participated in the study. Of the pregnant women ana-lyzed, 57.7% are from the territory covered by Area 2 and 42.3% are followed by the FHT of Area 1. The sociodemographic variables of the participants are organized as shown in Table 1. There was a predominance of women aged between 15 and 25 years (57.7%), brown (61.5%) and with complete high school education (34.6%).

Table 1 – Sociodemographic characterization of the study participants. Tauá, CE, Brazil, 2024.

Variables	N	%
Age group		
15 to 25 years	15	57,7
26 to 35 years old	08	30,8
36 to 45 years old	03	11,5
Race/Ethnicity		
White	6	23,1
Curtain	16	61,5
Black	2	7,70
Asian	1	3,85
Not informed	1	3,85
Schooling		
Incomplete elementary school	3	11,5
Complete elementary school	4	15,4
Completed high school	9	34,6
Incomplete tertiary education	1	3,8
Completed higher education	2	7,7
Not informed	7	27

Source: Survey data (2024).

Regarding clinical characteristics and obstetric history, the profile of the participants is shown in Table 2. Regarding previous pregnancies, almost half of the patients (46.1%) were primiparous, and more than one third (38.5%) had had a previous pregnancy. It was observed that most of the participants had no history of abortions (92.3%). Considering the current pregnancy, 53.9% did not perform reproductive plan-ning, 57.7% had the outcome of pregnancy with cesarean section (delivery with compli-cations of live birth).

Table 2 – Clinical and obstetric characterization of the study participants. Tauá, CE, Brazil, 2024.

Variables	N	%
Previous pregnancies		
Primiparous	12	46,1
1 previous pregnancy	10	38,5
2 previous pregnancies	2	7,7
3 or more previous pregnancies	2	7,7
Abortion history		
Yes	2	7,7
No	24	92,3
Planned current pregnancy		
Yes	12	45,1
No	14	53,9
Outcome of the current pregnancy		
Birth with a complication of live birth	15	57,7
Childbirth without complication of live birth	11	42,3
Family Health Strategy		
Area 1	11	42,3
Area 2	15	57,7

Source: Survey data (2024).

Regarding the characterization of prenatal consultations, most women (77.0%) started the routine of consultations up to 12 weeks of gestation, 92.3% had 6 or more prenatal consultations during the entire pregnancy period, performed the basic schedule of labor-atory and imaging tests recommended for the 1st and 3rd trimester of pregnancy (57.7%), during the consultations underwent obstetric and anthropometric evaluation procedures, with 5 or more records of each measurement performed (69.2%). Regarding the application of the Tdap vaccine, recommended from the 20th week of gestation, 73.1% of the pregnant women received one dose. Ferrous sulfate supplementation was prescribed and recorded for 96.2% of the patients, 80.8% of whom had at least one dental visit during pregnancy. And 69.2% of the medical records had recorded orientations that were given to the women.

Table 3 – Characterization of the prenatal consultations evaluated by the study. Tauá, CE, Brazil, 2024.

Variables	N	%
Gestational age at the beginning of prenatal care		
Up to 12 weeks gestation	20	77,0

13 to 27 weeks gestation	05	19,2
After 28 weeks of gestation	01	3,8
Total Queries Made		
Less than 6 consultations	2	7,7
6 or more queries	24	92,3
Requested and Registered Exams		
1st and 3rd trimester exam routine1	15	57,7
Incomplete routine exams	9	34,6
No Exam Recorded	2	7,7
Obstetric evaluation procedures		
Up to 2 records of each procedure	03	11,5
3 to 4 records of each procedure	05	19,2
5 or more records of each procedure	18	69,2
Application of the Tdap vaccine		
Yes	19	73,1
No	7	26,9
Ferrous sulfate supplementation		
Yes	25	96,2
No	1	3,8
Dental consultation		
Yes	21	80,8
No	05	19,2
Registration of guidance to pregnant women		
Yes	18	69,2
No	8	30,8

Source: Survey data (2024).

[1] Routine 1st trimester exams: Obstetric ultrasonography, blood typing and Rh factor, hemoglobia (Hb)/hematocrit (Ht) dosage, fasting blood glucose, Rapid test for syphilis and/or VDRL, rapid test for HIV and/or anti-HIV, HbsAg, Toxoplasmosis (IgG and IgM) and urinalysis (EAS); Routine 3rd trimester exams: Hb/Ht dosage, Rapid test for syphilis and/or VDRL, Rapid test for HIV and/or anti-HIV, HbsAg, Toxoplasmosis (IgM), blood glucose and EAS.

Therefore, the quality of prenatal care was evaluated, applying the guidelines of the Ministry of Health and the Kessner Index modified by Takeda (1993), obtained from four levels of quality. The percentage of adequacy of consultations decreased as more criteria were used to assess quality. At level 1, it presented 73.1% adequacy; at level 2, 57.7%; at level 3, 53.8% of the consultations were considered adequate; and at level 4, 50.0% of the care met the quality criteria (Table 4)..

Table 4 – Evaluation of the quality of prenatal care according to the guidelines of the Ministry of Health and the Kessner index. Tauá, CE, Brazil, 2024.

Levels	FHS 1 (N)	(%)	FHS 2 (N)	(%)	(N)	Total (%)
Level 1						
Adequate	6	54,6	13	86,6	19	73,1
Intermediary	4	36,4	2	13,4	06	23,1
Inadequate	1	9,0	-	-	01	3,8
Level 2						
Adequate	5	45,45	10	66,6	15	57,7
Intermediary	5	45,45	5	33,4	10	38,5
Inadequate	1	9,0	-	-	01	3,8
Level 3						
Adequate	5	45,5	9	60,0	14	53,8
Intermediary	5	45,5	6	40,0	11	42,3
Inadequate	1	9,0	-	-	1	3,8
Level 4						
Adequate	5	45,5	8	53,3	13	50,0
Intermediary	5	45,5	7	46,7	12	46,2
Inadequate	1	9,0	-	-	1	3,8

Source: Survey data (2024).

DISCUSSION

This research enabled the evaluation of low-risk prenatal care, through the identification of the potentialities and weaknesses of the records in the PEC by health professionals, physicians and nurses, as well as the care provided and the tests requested.

During data collection, weaknesses were observed in the sociodemographic variables of the medical records analyzed, with a lack of data, such as: marital status, monthly family income and occupation. This information is crucial to understand the social context of pregnancy and to enable comprehensive and equitable care[20]. In a recent study, which aimed to evaluate the records of prenatal consultations, there was also a significant number of medical records that did not present complete records about the identification, socioeconomic data, personal history and lifestyle habits of the pregnant woman, which should be collected during the first prenatal consultation[21].

With the data that could be collected, the delineation of the sociodemographic profile of the participants showed the prevalence of women in the age group between 15 and 25 years, brown and with complete high school education.

The data regarding age are in line with what was evidenced in a study conducted in the state of Piauí, in which 69.3% of the interviewees were in the age group of 20 to 35 years and 26.0% of 15 to 19 years[22]. The study carried out in the interior of Ceará showed that the pregnancy rate among women aged 15 to 19 years grew again in 2021, after a decline between 2019 and 2020[23].

It is crucial to direct personalized attention to mothers under the age of 19, considering that studies highlight deficiencies in the performance of prenatal visits. In addition, this age group is more prone to negative outcomes, such as premature birth, low birth weight babies, and lower Apgar scores at 5 minutes[24].

Regarding schooling, most of them have completed high school, a factor also reported in the study carried out in Pernambuco, which aimed to analyze the variables associated with adequate prenatal care. Studies have revealed that women with a higher level of education were 2.9 times more likely to access quality antenatal care services compared to those without formal education[25,26].

Instruction can help women understand the relevance of antenatal services, enabling them to make informed decisions about the use of health services. Similarly, it is believed that more educated women have a greater ability to conduct prenatal care comprehensively, since they have knowledge and a favorable attitude towards self-care[24].

Regarding skin color, the result of the research is similar to a recently published study, in which most of the women surveyed were brown. A study with the objective of evaluating the inadequacy of prenatal care, according to race/color, showed that black and brown women had worse indicators when compared to white women[27,28].

The present study shows a high rate of adequacy for the beginning of consultations before 12 weeks of gestation and the number of minimum consultations during the pregnancy cycle, which can be explained by the increasing ease of access to pregnancy diagnosis and the active search of health professionals and community agents. Corroborating these findings, one study found that 89% of pregnant women had six or more consultations during the pregnancy period[8,29].

The results of a study conducted in Taiwan indicated that a safe number of antenatal visits, along with adequate content, can decrease the risks of adverse outcomes during pregnancy in women with infertility, especially the likelihood of babies being born with very low birth weight. These findings underscore the importance of adequate prenatal care to promote positive outcomes during pregnancy. It is essential to highlight the need for frequent and punctual antenatal consultations, which offer crucial screening, testing and monitoring services, with the potential to mitigate the risks associated with adverse outcomes during childbirth[30].

Regarding the clinical and obstetric procedures performed during the consultations, which are important parameters for the continuous evaluation of fetal and maternal development and well-being, the research showed a significant rate of adequacy in relation to the minimum number of records established, which converges with what was found in a study carried out in Belo Horizonte, in which almost all (98.4%) of the prenatal cards contained these records[31].

However, there is a disagreement with the findings of other studies, regarding the physical and obstetric examination, in which most of the medical records presented missing records or incompleteness of crucial information, such as anthropometric and blood pressure data, in addition to the lack of records related to inspection, measurement of uterine height and palpation of the uterus. This gap evidences a failure in the performance of health professionals, since it hinders the execution of all the steps necessary for the adequate follow-up of the pregnant woman[31].

Regarding tetanus vaccination and ferrous sulfate supplementation, the present study showed high levels of achievement. Especially in relation to the application of Tdap, this data was similar in another study, in which 88.8% of pregnant women received this immunization. Therefore, in addition to tetanus prevention, it is essential to cover

the other vaccination schedules recommended for this population, and the prescription of elemental iron for the prevention of gestational anemia[32].

Regarding the dental consultation record, it was observed that this information was present in most of the medical records, which is considered extremely important. The lack of this service may indicate the possibility of negative outcomes in pregnancy, which associates oral diseases with events such as perinatal mortality, prematurity and/or low birth weight, in addition to preeclampsia. These associations are usually linked to precarious living conditions[33].

Another relevant factor was the records of orientations for pregnant women. A study conducted in Maranhão, in 2017, addressing the potentialities and weaknesses of the usual risk prenatal consultation, provided subsidies to improve the quality of prenatal care, highlighting the need to reorganize the service and the work process, aiming at expanding access and training of human resources, as well as a comprehensive reception for pregnant women and their families. incorporating the offer of educational actions[34]. These educational actions provide the preparation and empowerment of women to experience pregnancy and childbirth in a positive and integrative way[35].

In relation to the tests requested and recorded, it was the variable with the lowest adequacy index and with a significant rate of incomplete data related to what is recommended by the Ministry of Health. The request and proper interpretation of test results during prenatal care is an important way to monitor women to classify their gestational risk. Therefore, this practice should be satisfactorily adopted in all follow-ups performed in the services[36].

A detailed description of the procedures performed with the patient is essential for the composition of the medical record. This practice contributes to the continuity of care for the client, providing them with greater security and providing essential information for qualitative evaluations of the service provided. In addition, more detailed records provide greater ethical and legal support to the document, significantly assisting in auditing activities[37].

Considering the main outcome of the study, in the initial levels, in which fewer quality indicators are evaluated, there was a higher percentage of prenatal care evaluated as adequate. Over the course of the levels, when more variables are added for evaluation, the number of queries considered appropriate decreases.

The indicators of clinical procedures and laboratory tests, when analyzed separately, have a lower percentage of performance. This study corroborates a study in which it was found that prenatal care was considered adequate in terms of the total number of consultations and period of recruitment of pregnant women, and the clinical-obstetric procedures were considered satisfactory[24].

In contrast to the results of this study, some regions of Brazil have weaknesses related to non-adherence to prenatal care and its late onset. An integrative review, which examined antenatal care in primary care, revealed the presence of deficiencies in health care delivery. These deficiencies may include access difficulties, distance from health units, failures in family planning, late diagnosis of pregnancy, insufficient number of consultations, and lack of adequate reception, negatively impacting the effectiveness of the service[38].

A study carried out in Brazilian capitals found an average rate of adequacy of prenatal care of about 80%. The insufficiency of prenatal care was correlated with the lowest Municipal Human Development Index (HDI-M), age under 20 years, educational level of less than four years, belonging to a non-white race/color, and absence of a partner[39].

Considering that the evaluations of performance quality are made by the information systems, it is perceived that the data pertinent to the services are not recorded in a totally adequate and complete way, inferring that the procedures and actions that are not recorded in the information system are not performed. Therefore, it is necessary for professionals to correctly record all information in the spaces that are presented in the system, so that a reliable assessment of the quality of care is possible[40].

The study has as a limitation the specificity of the local reality in prenatal care, preventing generalizations. However, the data are representative and may contribute to redirecting public policies in maternal-fetal care. Another limitation identified was the occasional presence of unfilled data in the records, impairing the evaluation of care. This highlights the need to train and sensitize professionals in the area, emphasizing the importance of correctly filling out procedures and records for a more accurate assessment of the local reality.

CONCLUSION

The evaluation of the quality of prenatal care, through electronic medical records, was considered adequate at all levels of quality, in accordance with the guidelines of the Ministry of Health. However, weaknesses were identified in the patients' electronic medical records, especially related to sociodemographic information. This situation depends, to a large extent, on the professional's approach to prioritizing the appropriate records of necessary data and the health actions and services provided during care.

In view of these observations, it is essential to understand how the PEC is being used in care management. The results obtained are crucial to obtain information that helps in the identification of care deficiencies and to implement targeted actions posi-tively impacting the maternal and infant mortality indicator. This is reflected in a deeper knowledge of the reality of each user and their care needs.

REFERENCES

1. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Política Nacional de Atenção Integral à Saúde da Criança: orientações para implementação. Brasília: Ministério da Saúde; 2018.
2. Ministério da Saúde (BR). Secretaria de Atenção Primária à Saúde. Atenção ao pré-natal de baixo risco. Brasília: Ministério da Saúde; 2012.
3. Cunha AC, Lacerda JT, Alcauza MTR, Natal S. Avaliação da atenção ao pré-natal na Atenção Básica no Brasil. Rev. Bras. Saúde Mater. Infant. [online]. 2019; 19(2): 447–58. DOI: https://doi.org/10.1590/1806-93042019000200011
4. Ministério da Saúde (BR). Porta Brasil. Sistema de Informação sobre

5. Mortalidade. Mortalidade Infantil e Neonatal. Brasília: Ministério da Saúde; 2021.
6. Luz LA, Aquino R, Medina MG. Avaliação da qualidade da Atenção Pré-Natal no Brasil. Saúde debate [online]. 2018; 42(spe2):111–26. DOI: https://doi.org/10.1590/0103-11042018S208
7. França EB, Lansky S, Rego MAS, Malta DC, França JS, Teixeira R, et al. Principais causas da mortalidade na infância no Brasil, em 1990 e 2015: estimativas do estudo de Carga Global de Doença. Rev. bras. epidemiol. [online]. 2017; 20:46–60. DOI: https://doi.org/10.1590/1980-5497201700050005
8. Heaman MI, Martens PJ, Brownell MD, Chartier MJ, Derksen SA, Helewa ME. The Association of Inadequate and Intensive Prenatal Care With Maternal, Fetal, and Infant Outcomes: A Population-Based Study in Manitoba, Canada. J Obstet Gynaecol Can [online]. 2019; 41(7):947-959. DOI: https://doi.org/10.1016/j.jogc.2018.09.006
9. Tomasi E, Fernandes PAA, Fischer T, Siqueira FCV, Silveira DS, Thumé E, et al. Qualidade da atenção pré-natal na rede básica de saúde do Brasil: indicadores e desigualdades sociais. Cad. Saúde Pública [online]. 2017;33(3):e00195815. DOI: https://doi.org/10.1590/0102-311X00195815
10. Maciel DPA, Maciel GA, Oliveira Júnior AM, Dias GCC, Morais MJD, Aguiar KLA, et al. Mortalidade por sífilis congênita: revisão sistemática. Revista multidisciplinar em Saúde [online]. 2023;4(1):106-116. DOI: https://doi.org/ 10.51161/integrar/rems/3655
11. Ministério da Saúde (BR). Secretaria de Atenção Primária à Saúde. Portaria n° 2.979, de 12 de novembro de 2019. Brasília: Ministério da Saúde; 2019
12. Ministério da Saúde (BR). Sociedade Beneficente Israelita Brasileira Albert Einstein. Nota técnica para organização da rede de atenção à saúde com foco na atenção primária à saúde e na atenção ambulatorial especializada –saúde da mulher na gestação, parto e puerpério. Brasília: Ministério da Saúde; 2019
13. Ávila GS, Cavalcante RB, Gontijo TL, Carbogim F da C, Brito MJM. Prontuário eletrônico na gestão do cuidado em equipes de saúde da família. Cogitare Enferm. [online]. 2022; 27. DOI: http://dx.doi.org/10.5380/ce.v27i0.79641
14. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Secretaria-Executiva. e-SUS Atenção Básica : Manual do Sistema com Prontuário Eletrônico do Cidadão PEC – Versão 3.2. Brasília: Ministério da Saúde; 2019.
15. Dornan L, Pinyopornpanish K, Jiraporncharoen W, Hashmi A, Dejkriengkraikul N, Angkurawaranon C. Utilisation of electronic health records for public health in Asia: a review of success factors and potential challenges. Bio Med Res. Int. [online] 2019; 1:1-9. DOI: http://doi. org/10.1155/2019/7341841.
16. Guimarães WSG, Parente RCP, Guimarães TLF, Garnelo L. Acesso e qualidade da atenção pré-natal na Estratégia Saúde da Família: infraestrutura, cuidado e gestão. Cad. Saúde Pública [online]. 2018; 34(5):e00110417. DOI: https://doi.org/10.1590/0102-311X00110417
17. Neves RG, Flores-Quispe MDP, Facchini LA, Fassa AG, Tomasi E. Pré-natal no Brasil: estudo transversal do Programa de Melhoria do Acesso e da Qualidade da Atenção Básica, 2014. Epidemiol. Serv. Saúde [online]. 2020; 29(1):e2019019. DOI: https://doi.org/10.5123/S1679-49742020000100008
18. IBGE. Instituto Brasileiro De Geografia e Estatística. Informações estatísticas. Rio
19. de Janeiro: IBGE. 2010.
20. Takeda, S. Avaliação de unidade de atenção primária: modificação dos indicadores de saúde e qualidade da atenção. [Dissertação de Mestrado]. Pelotas: Universidade Federal de Pelotas; 1993.
21. Anversa ETR, Bastos GAN, Nunes LN, Dal Pizzol TS. Qualidade do processo da assistência pré-natal: unidades básicas de saúde e unidades de Estratégia Saúde da Família em município no Sul do Brasil. Cad. Saúde Pública [online]. 2012;28(4):789–800. DOI: https://doi.org/10.1590/S0102-311X2012000400018
22. Pereira JCN, Silva SL, Lira PIC, Batista Filho M, Azevedo PÁCC, Martins ACPCB, et al. Fatores associados a assistência pré-natal adequada em Pernambuco. Revista Eletrônica Acervo Saúde [online]. 2023;23(3). DOI: https://doi.org/10.25248/reas.e12723.2023
23. Jardim MJA, Rios CTF, Frias LMPS, Costa CA, Fonseca LMB. Registros e oferta de ações educativas: implicações no pré-natal. Revista Eletrônica Acervo Saúde [online] 2023;23(7), e12767. DOI: https://doi.org/10.25248/reas.e12767.2023

24. Barbosa EM, Oliveira ASS, Galiza DDF, Barros VL, Aguiar VF, Marques MB. Perfil sociodemográfico e obstétrico de parturientes de um hospital público. Rev Rene [online]. 2017;18(2):227-233. DOI: https://10.15253/2175-6783.2017000200012
25. Batista MLB, Viração GA, Cordeiro NF, Andrade GA, Cavalcante MV, Nascimento AJ, et al. Epidemiologia da gravidez na adolescência em Quixeramobim-CE. Cadernos ESP [online]2023;17(1):e1463. DOI: https://doi.org/10.54620/cadesp.v17i1.1463
26. Pantoja IN, Pantoja CEF, Ferreira GRON, Valois RC, Pimentel HFS, Moraes GC, et al. Associação entre número de consultas pré-natal e as características maternas e neonatais. Revista Eletrônica Acervo Saúde [online]. 2021;13(10):e8843. DOI: https://doi.org/10.25248/REAS.e8843.2021
27. D. Teji, G. Tekelehaymanot e D. Mesfin, Avaliação da qualidade da prestação de serviços de cuidados pré-natais e factores associados em unidades de saúde governamentais de Harar Town Eastern Ethopia , Haramaya University, 2017.
28. Kassaw A, Debie A, Geberu DM, Qualidade do cuidado pré-natal e fatores associados entre mulheres grávidas em instalações de saúde pública do distrito de Wogera, noroeste da Etiópia. Journal of Pregnancy [online]. 2020;2020. DOI: https://doi.org/10.1155/2020/9592124
29. Nascimento AGS, Santos PVM, Esteves MMN, Pierot EV, Oliveira LS, Ribeiro ALM. Adequação da assistência pré-natal entre puérperas em uma maternidade do nordeste brasileiro. Arquivos de Ciências da Saúde da UNIPAR. [online]. 2023[citado 2024-01-02];27(8):4627-4641. Disponível em: https://ojs.revistasunipar.com.br/index.php/saude/article/view/10496/5047
30. Leal MC, Gama SGN, Pereira APE, Pacheco VE, Carmo CN, Santos RV. A cor da dor: iniquidades raciais na atenção pré-natal e ao parto no Brasil. Cad Saúde Pública [online]. 2017;33:e00078816. DOI: https://doi.org/10.1590/0102-311X00078816
31. Almeida CPF, Silva JA, Araújo JIF, Azevedo ACB. Assistência ao pré-natal no rio grande do Norte: acesso e qualidade do cuidado na atenção básica. Ciência Plural [online]. 2021[citado 2023-12-24];7(3):61-80. Disponível em: https://periodicos.ufrn.br/rcp/article/view/22151/14658
32. Alibekova R, Huang JP, Chen YH. Adequate prenatal care reduces the risk of adverse pregnancy outcomes in women with history of infertility: a nationwide population-based study. PLoS One [online] 2013;8(12):e84237. DOI: 10.1371/journal.pone.0084237.
33. Defilipo ÉC, Chagas PSC, Silva RM, Costa QBS, Guilherme MCO, Ferreira MCP, et al. Prenatal and perinatal care in Governador Valadares, Minas Gerais state, Brazil. Fisioter mov [online]. 2022;35(spe):e35608. DOI: https://doi.org/10.1590/fm.2022.35608
34. Pedraza DF, Silva AJM. Indicators of prenatal care received by Family Health Strategy users in cities of the State of Paraíba. ABCS Health Sciences [online]. 2021;46:e021214. DOI: https://doi.org/10.7322/abcshs.2019112.1371
35. Vieira HRL, Dornelis LR, Silva, JCS, Rezende IRL, Fonseca TS, Varejão LC. A importância do pré-natal odontológico. Brazilian Journal of Health Review [online]. 2023;6(6):31263–31276. DOI: https://doi.org/10.34119/bjhrv6n6-360
36. Silva AA, Jardim MJA, Rios CTF, Fonseca LMB, Coimbra LC. Pré-natal da gestante de risco habitual: potencialidades e fragilidades. Revista De Enfermagem Da UFSM [online]. 2019;9:e15. DOI: https://doi.org/10.5902/2179769232336
37. Lima MB, Silva RKR, Passos SG. A importância da educação em saúde na atenção ao pré-natal. Rev Inic Cient Ext [online]. 2021[citado 2023-12-10];4(2):720-36. Disponível em: https://revistasfacesa.senaaires.com.br/index.php/iniciacao-cientifica/article/view/333
38. Dantas DS, Mendes RB, Santos JMJ, Valença TS, Mahl C, Barreiro MSC. Quality of prenatal care in the unified health system. Rev. Enferm. UFPE [online]. 2018; 12(5):1365-71. DOI: https://doi.org/10.5205/1981-8963-v12i5a230531p1365-1371-2018
39. Silva Júnior JNB, Guedes HCS, Januário DC, Silva ACO, Palha PF, Nogueira MF, et al. Unsatisfactory completeness of nurses' records in the medical records of users with tu-berculosis. Rev Bras Enferm [online]. 2022;75(3):e20210316. DOI: https://doi.org/10.1590/0034-7167-2021-0316
40. Nascimento DS, Nascimento DS, Silva VFA, Belarmino CMV, Lago VCALP. Assistência de enfermagem ao pré-natal na atenção básica: uma revisão integrativa. Revista Artigos.Com [online].2021 [citado 2023-12-10];27:e7219. Disponível em: https://acervomais.com.br/index.php/artigos/article/view/7219

41. Ramos Jr. AN. Persistência da sífilis como desafio para a saúde pública no Brasil: o caminho é fortalecer o SUS, em defesa da democracia e da vida. Cad Saúde Pública [Internet]. 2022;38(5):PT069022. DOI: https://doi.org/10.1590/0102-311XPT069022

42. Silva TIM, Cavalcante RB, Santos RC, Gontijo TL, Guimarães EAA, Oliveira VC. Dif-fusion of the e-SUS primary care innovation in family health teams. Rev. Bras. Enferm. [Internet] 2018; 71: 2945-2952. DOI: http://dx.doi.org/10.1590/0034-7167-2018-0053.