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Avaliação da influência do abandono da assistência pré-natal na mortalidade fetal e neonatal

Assessment on the influence of prenatal care abandonment in fetal and newborn mortality

Influencia de la evaluación de cuidado prenatal de abandono en la mortalidad fetal y neonatal

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ABSTRACT

Objective: To evaluate the influence of prenatal care abandonment in fetal and neonatal mortality. **Methods:** Assessment study, descriptive and exploratory, primarily on documentary evidence, using a quantitative approach, conducted from October to November 2014. It was used as a data source, 400 death certificates and 400 investigation files of fetal and neonatal deaths and reported in the years 2010 to 2013 were analyzed using the Statistical Package for Social Sciences, to obtain the absolute and relative frequencies, nominal and numerical variables and chi-square Person. The study was approved by the Research Ethics Committee of the State University of Maranhão (CAAE 26463814.2.0000.5554). **Results:** When the correlation between prenatal neglect and fetal and neonatal mortality was evaluated, it was observed that the mortality of fetuses, and newborns whose progenitors have left the prenatal care was a growing event. **Conclusion:** It was possible to confirm the direct influence of prenatal cessation in fetal and neonatal mortality.

Descriptors: Prenatal Care, Fetal Mortality, Infant Mortality, Nursing.

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RESUMO

Objetivo: Avaliar a influência do abandono da assistência pré-natal na mortalidade fetal e neonatal. **Métodos:** Estudo avaliativo, descritivo-exploratório, de cunho documental, com abordagem quantitativa, realizado de outubro a novembro de 2014. Utilizou-se como fonte de dados, 400 declarações de óbitos e 400 fichas de investigação de óbitos fetais e neonatais, ocorridos e notificados nos anos de 2010 a 2013. Foram analisados por meio do Statistical Package for the Social Sciences, para obtenção das frequências absolutas e relativas, variáveis nominais e numéricas e Qui-quadrado de Person. A pesquisa foi aprovada pelo Comitê de Ética em Pesquisa da Universidade Estadual do Maranhão (CAAE 26463814.2.0000.5554). **Resultados:** Quando avaliada a correlação entre o abandono do pré-natal e a mortalidade fetal e neonatal, observou-se que a mortalidade de fetos/neonatos de genitoras que abandonaram o pré-natal foi um evento crescente. **Conclusão:** Pode-se confirmar a influência direta do abandono do pré-natal na mortalidade fetal e neonatal.

Descritores: Assistência Pré-natal, Mortalidade Fetal, Mortalidade Infantil, Enfermagem.

RESUMEN

Objetivo: Evaluar la influencia del abandono de la atención prenatal fetal y mortalidad neonatal. **Métodos:** Estudio de Evaluación, descriptivo y exploratorio, principalmente en pruebas documentales, utilizando un enfoque cuantitativo, realizado entre octubre y noviembre de 2014. Fue utilizado como una fuente de datos, 400 certificados de defunción y 400 expedientes de investigación de las muertes neonatales y fetales y reportado en los años 2010 a 2013, fueron analizados mediante el Statistical Package for Social Sciences, para obtener las frecuencias absolutas y relativas, variables nominales y numéricas y de chi-cuadrado del Person. El estudio fue aprobado por el Comité de Ética de Investigación de la Universidad del Estado de Maranhão (CAAE 26463814.2.0000.5554). **Resultados:** Cuando se evaluó se observó la correlación entre el descuido prenatal y mortalidad fetal y neonatal que la mortalidad de los fetos/progenitores de los recién nacidos que han abandonado el cuidado prenatal fue un evento cada vez mayor. **Conclusión:** Fue posible confirmar la influencia directa de la cesación prenatal en la mortalidad fetal y neonatal.

Descriptorios: Atención Prenatal, Mortalidad Fetal, Mortalidad Infantil, Enfermería.

INTRODUCTION

Health actions related to Primary Health Care (PHC) are characterized by a set of measures at individual and collective level that cover the promotion and protection of health, disease prevention, diagnosis, treatment, rehabilitation and maintenance of health. They are developed through the exercise of democratic and participatory managerial and health practices in the form of teamwork, directed to populations of well-defined territories, for which they take responsibility for health, considering the existing dynamics in the territory in which these populations live. Among the various functions of APS, it is highlighted the prenatal care that makes a correction between women's health and children's health.¹

Prenatal care comprises a set of activities capable of guiding the promotion of health of pregnant women and

their fetuses, establishing appropriate actions to prevention, diagnosis and clinical management of obstetric problems that may occur, or pre-existing illness, providing opportunities for the earliest treatment possible and ensuring a healthy birth of the child.²

For a quality prenatal care, expensive facilities, complex technology or sophisticated laboratories are not indispensable, but the guarantee of access to services in all health care networks, with qualified human resources supply and diagnostic and therapeutic methods suitable for detection and treatment of morbidities, with reference assurance and counter reference.³⁻⁴

Thus, proper prenatal care reduces maternal, fetal and neonatal morbidity and mortality rates, contributes to the early detection of changes in fetal development, reducing not only the risk of complications that lead to high rates of morbidity and mortality for women and newborn, as well as the number of intrauterine death. It should be emphasized that it is important to consider both coverage and quality of prenatal care.⁵

Conceptually, fetal death refers to the death of the product of conception before the expulsion or complete extraction from the mother's body. Thus, it is indicated as fetal death, the fetus that after maternal separation does not breathe or show any other sign of life, such as heartbeat, umbilical cord pulsation, or definite movement of voluntary muscles. Neonatal death is defined as the death of alive fetuses that occurs before 27 completed days of life.⁶

Meanwhile, despite the expansion of health care and consequently the improvement in antenatal services coverage in Brazil, due to the implementation and advancement of the Family Health Strategy, inequalities in care and access offered remain current. Therefore, it is recommended that pregnant women start the assistance as soon as the pregnancy is identified, in order to strengthen adherence and access to quality care, ensuring the achievement of additional tests, and diagnosing pregnant women with risk factors earlier.⁷

The observation of the high quantity of fetal and neonatal deaths in the city of Caxias, Maranhão, published in the Department of Health System Information, motivated the development of this study, since it prompted the need to identify possible causes and contributing factors to high levels of this type of recorded mortality. Given this, the study aimed to evaluate the influence abandonment has upon prenatal care on fetal and neonatal mortality.

METHODS

An evaluative, and descriptive-exploratory study, was made primarily on documentary evidence, using a quantitative approach, in the city of Caxias, Maranhão. This city has 32 Basic Health Units, 21 in urban areas and 11 in rural areas, with about 50 health teams and family coverage of approximately 92%.

Data were collected from October to November 2014 on the city's Coordination of Primary Attention and Health Surveillance, more specifically in the Epidemiological Surveillance sector, through the death statements and deaths Research Sheets, occurred and reported in the years of 2010 to 2013, of mothers living in Caxias.

It was analyzed 400 sheets of deaths research and 400 Death Declarations (fetal and neonatal). Applying the inclusion criteria: completeness of the information data collection instrument (type of death, number of prenatal visits, prenatal neglect, year of death notification, year of death and age at death); deaths of fetuses/infants of mothers living in Caxias; and deaths are fetuses and neonates from 2010 to 2013. Were excluded from the study, 281 sheets of deaths research and deaths statements, of which: 67 of 2010 (all) 81 of 2011, 91 of 2012 and in 2013, were excluded 42 records and statements. Therefore it took part of the sample 119 Sheets and 119 statements that fitted the inclusion criteria.

After collection, data were organized in Excel (version 2010) and analyzed using the software Statistical Package for the Social Sciences (version 19.0) to obtain the absolute and relative frequencies, nominal and numerical variables, and chi-square (X²) of Pearson (which correlates multiple variables). This test has a default value to confirm the correlation between two variables, and tests with lower levels of significance than 3,841 are assumed to have no correlation between the variables, and the variables are independent.

The research project was submitted to Platform Brazil and directed to the Committee of Research Ethics on the Center for Higher Studies of Caxias, from the State University of Maranhão, being adopted in the opinion of approval nº 710.002/2014 and number of CAAE 26463814.2.0000.5554.

RESULTS

Table 1 shows the total death investigation sheets and statements of fetal and neonatal deaths used in the research, distributed based on the occurrence of death year (2010-2013).

Table 1 - Total of Fetal/Neonatal deaths Research Sheets and Statements of Fetal/Neonatal deaths included in the survey, according to inclusion and exclusion criteria. Caxias/MA, 2014

Year	Research Sheets	Death Declarations
	n (%)	n (%)
2010	0 (0,0)	0 (0,0)
2011	17 (14,3)	17 (14,3)
2012	43 (36,1)	43 (36,1)
2013	59 (49,6)	59 (49,6)
Total	119 (100)	119 (100)

Based on data provided by the Epidemiological Surveillance of Caxias, in the investigated period (2010-2013) there were 400 deaths of fetuses/infants. The data provided

by the State Secretary of Health and the Department of Health System Information showed lower numbers, being 66 deaths in 2010, 94 in 2011, 52 in 2012 and 79 in 2013, totalizing 291 deaths.

Thus, it was possible to show a marked difference between the state/national and municipal statistics. What certainly puts the city in a situation of illegality, given that the notifications of fetal and neonatal deaths in a city are mandatory.

The obvious deficits in the system of notification and investigation of fetal and neonatal deaths in Caxias, reduce the chances of implementing new public policies related to the health of children and women, given that the lack of such data masks the maternal mortality rate, fetal and neonatal of the city, and hide their real health situation.

When observing the most prevalent type of death in the analyzed years (2011-2013), it could be seen that there is a prevalence of neonatal deaths over fetal, 66 (55.46%) neonatal and 53 (44.54%) fetal.

Table 2 shows the distribution of fetal and neonatal deaths according to the variables of prenatal neglect and fetal and neonatal mortality. Taking into account the deaths occurred and reported in the years 2011 to 2013.

Table 2 - Correlation between prenatal abandonment with fetal and neonatal mortality. Caxias/MA, 2014

Pre-natal abandonment	Fetal and neonatal mortality	Chi-squared
	n (%)	
Yes	68 (57,1)	4,509
No	51 (42,9)	
Total	119 (100,0)	

When the correlation between prenatal abandonment and fetal and neonatal mortality was evaluated, it was observed the prevalence of mortality of fetuses/newborns whose progenitors have left the prenatal care. The correlation between nominal variables, prenatal abandonment and type of mortality (fetal/neonatal), could have been proven through statistical test (chi-square), which obtained a correlation value of average significance, supporting the statement that has bivariate correlation.

In Table 3, there is a correlation between the amount of queries with the nurse and fetal and neonatal mortality. In which, it is explained the number of consultations with the nurse correlated with fetal/neonatal mortality.

Table 3 - Quantitative correlation of the relationship of prenatal consultations with the nurse and fetal and neonatal mortality. Caxias/MA, 2014

Consultations with the nurse	Fetal and neonatal mortality n (%)	Chi-squared
1	24 (20,2)	5,212
2	44 (37,0)	
3	31 (26,1)	
4	13 (10,9)	
5	5 (4,2)	
≥ 6	2 (1,7)	
Total	119 (100,0)	

Using the Chi-square test, it could be said that a bivariable: number of consultations with nurses and fetal/neonatal mortality are interconnected, having in mind it was obtained significance value indicating strong correlation. This fact confirms the importance of the nurse in the realization of prenatal care.

Table 4 shows the correlation of fetal and neonatal deaths with the amount of prenatal consultations with the doctor.

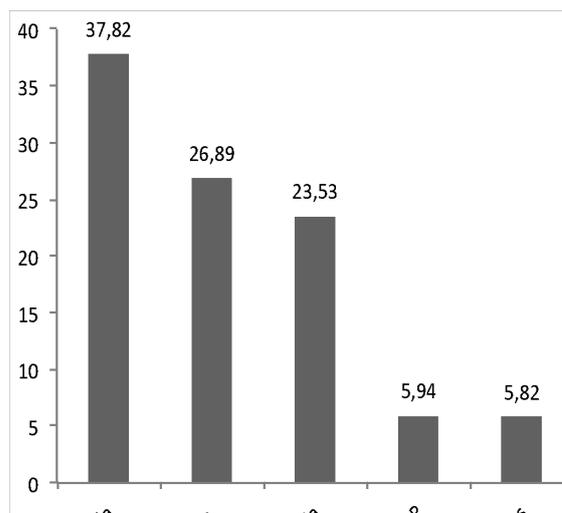
Table 4 - Correlation of prenatal consultations with doctors and fetal and neonatal mortality. Caxias/MA, 2014

Consultations with doctors	Fetal and neonatal mortality n (%)	Chi-squared
0 Consultation	46 (38,7%)	5,780
1 Consultation	29 (24,4%)	
2 Consultations	26 (21,8%)	
3 Consultations	11 (9,2%)	
4 Consultations	7 (5,9%)	
Total	119 (100,0%)	

It is observed a higher percentile of mortality among mothers who had no consultations with the doctor, while the lower frequency of fetal and neonatal deaths were found among the progenitors that had higher quantity of prenatal visits to the doctor. This fact highlights the importance of this professional in the comprehensive health care of women in pregnancy and puerperal phases, especially in the prenatal period.

Figure 1 demonstrates the most prevalent causes of death among investigated; in which, it could be observed that death from unknown causes ranks first among the causes of fetal and neonatal deaths.

Figure 1. Main causes of fetal and neonatal deaths investigated. Caxias / MA, 2014.



The high prevalence of deaths due to unknown causes is another negative statistic that the city has, considering that ignorance of the cause of death, which highlights the failure to investigate the death by the health team, or at least a lack of preparation of the municipality to perform the diagnosis of perinatal deaths.

DISCUSSION

A research performed in Uberlândia, Minas Gerais, ascertained that addressing the problems of underreporting of deaths and births, many Brazilian statistics can be unrealistic and/or incomplete, causing losses to the nation, as public health policies are planned and implemented based on epidemiological data.⁸

As for the prevalence of types of deaths (fetal or neonatal), research conducted in a referential hospital in Recife, Pernambuco, showed results contrary to this research. In which it noted the predominance of fetal deaths, which accounted for 113 (57.8%) over neonatal deaths 97 (42.2%).⁹

A research about fetal and neonatal mortality rate in Brazil showed the prevalence of neonatal death (57.6%) over fetal (42.4%). It was also found that this statistics has remained, being that there were a few early neonatal modifications (0 to 6 days), which plays an important role in excessive infant deaths.¹⁰

An integrative review carried out in 2012 showed results that corroborate with this research, stating that neonatal mortality has been configured as a growing concern for public health in Brazil since the 90s, when it became the main component of infant mortality, due to the more pronounced reduction in post-neonatal mortality.¹¹

A research conducted in Australia and New Zealand found that inadequate prenatal or its abandonment is directly associated with increased fetal and neonatal mortality. In which this association can be observed through the observation of the increase in the number of premature

births and infants of low birth weight. And it is known that premature and low birth weight infants are more exposed to risk factors for morbidity and mortality.¹²

A research with 68 pregnant women in Caxias, Maranhão, highlighted the importance of prenatal completeness, considering that the guidelines made available to pregnant women in consultations directly influence the maternal and fetal health. In which the prenatal abandonment prevents the progenitor receiving basic information about all of the pregnancy-puerperal process.¹³

A study developed in Campinas, São Paulo, pointed out that the participation of nurses brought significant improvement to the quality of prenatal care over the years. And it is noteworthy that, without the nurse, this attention would probably be restricted to individual consultations, based on complaints and conducts, obstetrical examination and interpretation/examination requests.¹⁴

A research developed throughout Brazil presents results that are similar to this study when it states that the nurse's performance is critical to the mortality's reduction among this public. Thus, it was found that the nurse (within the legal framework of the profession) plays all prenatal actions, from actions of assistance to health promotion.¹⁵

Despite the lack of correlation studies between the amount of prenatal visits to the doctor and the fetal and neonatal mortality, a survey conducted in São Paulo/SP in 2010, showed results that confirm this research. In which 95% of the municipal area studied was covered by the Family Health Strategy, but only 57% of pregnant women in that municipality conducted prenatal checkups with the doctor, and fetal and neonatal mortality rate was extremely high in that year.¹⁶

A research conducted in the metropolitan area of Fortaleza, Ceará, highlighted the importance of completion of prenatal care for the maintenance of maternal and fetal wellbeing. However, among the study population (347 women), 60 (80%) initiated prenatal care in the third trimester, which prevents the realization of numerous pre-conception cares.¹⁷

Regarding investigated deaths' etiology, a study showed similar results to this one, in which the main causes of deaths were prematurity, hypoxia and deaths from unknown causes, with 42.4% of all fetal and neonatal deaths investigated.¹⁸ The pictures of hypoxia also were major causes of death in evaluative research with 565 RNs in Rio de Janeiro/RJ, being present in 40% of cases.¹⁹

A cohort study of births carried out in Pelotas/RS, identified a neonatal mortality rate of 19.7 per thousand live births, of these deaths 66% occurred in the neonatal period and the main cause of death was prematurity.²⁰

CONCLUSION

The infant mortality rate is one of the indicators most commonly used to measure the quality of life of a population, and is one of the items that make up the Human Development Index and other socio-economic indicators.

The results presented in this study warn of a fact already well known that prenatal influences decisively in reducing fetal and neonatal mortality. However, some more evidence was raised in this research, such as deficits in the reporting and research system of Caxias' deaths; significant importance of nurses in prenatal care; and prevalence of neonatal mortality on fetal stage, especially the death of premature newborns (0 to 6 days).

It was conducted the correlation between the different variables outlined in the study, and showed up predominantly that prenatal neglect and insufficient consultation with the nurse are the main factors that cause fetal and neonatal mortality.

It was confirmed, therefore, the direct correlation between prenatal abandonment with fetal and neonatal mortality. Among pregnant women who have left the prenatal, there was a predominance of fetal deaths and newborns over progenitors who have completed their preconception care.

In this perspective, it is suggested that there be a strengthening of the adherence to prenatal care, encouraging pregnant women to carry out pre-conception consultation, improving the program structure, team transport guarantee of the Family Health Strategy for conducting home visits in order to facilitate the identification and early identification of pregnant women. Regarding the main difficulties encountered in carrying out the research, are evident: incomplete documents (death investigation records and death certificates) and limited data source.

REFLEXIVE QUESTIONS

What are the main obstacles of research documentary data related to primary health care? Concerning the methodological approach, what is the best approach to make given the incompleteness of data related to the evaluation of health care? Faced with the uncertainty of reliable data provided by primary health care, how to present reliable results to national and international databases?

REFERENCES

1. Lavras C. Atenção primária à saúde e a organização de redes regionais de atenção à saúde no Brasil. **Saúde e Soc.** 2011; 20(4): 234-43. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-12902011000400005.
2. Souza VB, Roecker S, Marcon SS. Ações educativas durante a assistência pré-natal: percepção de gestantes atendidas na rede básica de Maringá-PR. **Rev Eletr Enferm.** 2011; 13(2): 199-210. Available from: <http://dx.doi.org/10.5216/ree.v13i2.10162>.
3. Tomasi E, Facchini LA, Thumé E, Piccini RX, Osorio A, Silveira DS, et al. Características da utilização de serviços de atenção básica à saúde nas regiões Sul e Nordeste do Brasil: diferenças por modelo de atenção. **Ciênc Saúde Coletiva.** 2011; 16(11): 98-110. Available from: <http://www.scielo.br/pdf/csc/v16n11/a12v16n11.pdf>.
4. Gonçalves R, Urasaki MBM, Merighi MAB, D'Avilla CG. Avaliação da efetividade da assistência pré-natal de uma Unidade de Saúde da Família em um município da Grande São Paulo. **Rev Bras Enferm.** 2010; 61(3): 349-53. Available from: <http://www.scielo.br/pdf/reben/v61n3/a12v61n3.pdf>.
5. Santos PP. Avaliação da qualidade ou avaliação qualitativa do cuidado em saúde. **Cad Saúde Pública.** 2014; 48(2): 234-43.
6. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. **Manual do pré-natal de baixo risco.** Brasília: Ministério da Saúde; 2012.
7. Almeida AD, Barros GDF. Cuidados de enfermagem na transição do papel materno entre puérperas. **Rev Eletr Enferm.** 2013; 15(2): 457-75.
8. Campos D, Loschi RH, França E. Mortalidade neonatal precoce hospitalar em Minas Gerais: associação com variáveis assistenciais e a questão da subnotificação. **Rev Bras Epidemiol.** 2010; 10(2): 223-338. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-790X2007000200010.
9. Aquino TA, Guimarães MJB, Sarinho SW, Ferreira LOC. Fatores de risco para a mortalidade perinatal no Recife, Pernambuco, Brasil. **Cad Saúde Pública.** 2011; 27(12): 89-95. Available from: <http://www.scielosp.org/pdf/csp/v23n12/05.pdf>.
10. Lansky S, Friche AAL, Silva AAM, Campos D, Bittencourt SDA, Carvalho ML, et al. Pesquisa Nascer no Brasil: perfil da mortalidade neonatal e avaliação da assistência à gestante e ao recém-nascido. **Cad Saúde Pública.** 2014; 30(sup 1): 192-207. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2014001300024.
11. Lansky S, França E, Leal MC. Mortalidade perinatal e evitabilidade: revisão da literatura. **Rev Saúde Pública.** 2012; 46(6): 45-50. Available from: <http://www.scielo.br/pdf/rsp/v36n6/13534.pdf>.
12. Chen Y, Rogoff K, Rossi B. Can Exchange Rates Forecast Commodity Prices? **Quart Jour Econ.** 2010; 125(3): 1145-94. Available from: <http://www.nber.org/papers/w13901>.
13. Gomes RNS, Gomes VTS, Caldas DRC, Lago EC, Campos FKL, Gomes MS. Avaliação do estado nutricional de gestantes atendidas em unidades básicas de saúde de Caxias/MA. **Rev Interd.** 2014; 7(4): 81-90. Available from: http://revistainterdisciplinar.uninovafapi.edu.br/index.php/revinter/article/view/474/pdf_161.
14. Brandão ICA, Godeiro ALS, Monteiro AI. Assistência de enfermagem no pré-natal e evitabilidade de óbitos neonatais. **Rev Enferm UERJ.** 2012; 20(supl. 1): 596-602. Available from: <http://www.facenf.uerj.br/v20nesp1/v20e1a08.pdf>.
15. Cardoso LSM, Mendes LL, Velásquez-Meléndez G. Diferenças na atenção pré-natal nas áreas urbanas e rurais do Brasil: estudo transversal de base populacional. **Rev Min Enferm.** 2012; 17(1): 345-63.
16. Narchi NA. Mortalidade materna no estado da Paraíba: associação entre variáveis. **Rev Esc Enferm USP.** 2010; 44(3): 89-100. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342010000300026.
17. Valente MMQP, Freitas NQ, Áfio ACE, Sousa CSP, Evangelista DR, Moura ERF. Prenatal care: a look at the quality. **Rev Rene.** 2013; 14(2): 280-90. Available from: <http://www.revistarene.ufc.br/revista/index.php/revista/article/view/177>.
18. Lourenço EC, Brunken GS, Luppi CG. Mortalidade infantil neonatal: estudo das causas evitáveis em Cuiabá, Mato Grosso, 2007. **Epidemiol Serv Saúde.** 2013; 22(4): 97-103. Available from: <http://scielo.iec.pa.gov.br/pdf/ess/v22n4/v22n4a16.pdf>.
19. Drumond EF, Machado CJ, França CJ. Óbitos neonatais precoces: análise de causas múltiplas de morte pelo método Grade of Membership. **Cad Saúde Púb.** 2011; 27(1): 67-77. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2007000100017.
20. Barros AJD, Matijasevich A, Santos IS, Albernaz EP, Victora CG. Neonatal mortality: description and effect of hospital of birth after risk adjustment. **Rev Saúde Púb.** 2012; 45(1): 9-16. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102008000100001.

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