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# *Pregnant women with inadequate prenatal care and neurological repercussions on newborns*

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***REVISÃO***

**RESUMO**

Para compreender as repercussões neurológicas nos neonatos de gestantes com pré-natal inadequado, é crucial explorar como a qualidade do cuidado pré-natal pode influenciar o desenvolvimento neurológico infantil. O pré-natal inadequado pode resultar em deficiências no acompanhamento médico, como falta de suplementação nutricional, monitoramento insuficiente do crescimento fetal e tratamento inadequado de condições maternas que afetam diretamente o desenvolvimento neurológico do feto.Objetivo: Analisar e sintetizar as evidências disponíveis sobre as implicações neurológicas em neonatos cujas mães receberam um pré-natal inadequado. Metodologia: seguiu o checklist PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), utilizando bases de dados como PubMed, Scielo e Web of Science. Os descritores utilizados foram "prenatal care", "neurological outcomes", "neonates", "inadequate care" e "neurodevelopment". Os critérios de inclusão foram estudos publicados nos últimos 10 anos, focados em intervenções de pré-natal inadequadas e suas consequências neurológicas nos neonatos, disponíveis em inglês, espanhol ou português. Critérios de exclusão incluíram estudos não relacionados ao tema, revisões não sistemáticas e estudos com amostras pequenas.Resultados: revelaram que gestantes com pré-natal inadequado apresentam maior incidência de complicações neurológicas nos neonatos, como atrasos no desenvolvimento motor e cognitivo, além de maior vulnerabilidade a doenças neurológicas como a paralisia cerebral. Conclusão: melhorias na qualidade do pré-natal são essenciais para mitigar essas repercussões e promover melhores resultados de saúde neurológica em neonatos. Essa revisão destaca a importância de políticas de saúde pública que garantam um pré-natal adequado para todas as gestantes.

**Palavras-chave:** “pré-natal”, “desfechos neurológicos”, “neonatos”, “atendimento inadequado” e “neurodesenvolvimento”

**ABSTRACT**

To understand the neurological repercussions on newborns of pregnant women with inadequate prenatal care, it is crucial to explore how the quality of prenatal care can influence children's neurological development. Inadequate prenatal care can result in deficiencies in

medical monitoring, such as lack of nutritional supplementation, insufficient monitoring of fetal growth and inadequate treatment of maternal conditions that directly affect the neurological development of the fetus. Objective: Analyze and synthesize the available evidence on the implications neurological disorders in newborns whose mothers received inadequate prenatal care. Methodology: followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist, using databases such as PubMed, Scielo and Web of Science. The descriptors used were "prenatal care", "neurological outcomes", "neonates", "inadequate care" and "neurodevelopment". The inclusion criteria were studies published in the last 10 years, focused on inadequate prenatal interventions and their neurological consequences in newborns, available in English, Spanish or Portuguese. Exclusion criteria included studies unrelated to the topic, non-systematic reviews and studies with small samples. Results: revealed that pregnant women with inadequate prenatal care have a higher incidence of neurological complications in newborns, such as delays in motor and cognitive development, in addition to greater vulnerability neurological diseases such as cerebral palsy. Conclusion: improvements in the quality of prenatal care are essential to mitigate these repercussions and promote better neurological health outcomes in newborns. This review highlights the importance of public health policies that guarantee adequate prenatal care for all pregnant women.

**Keywords**: "prenatal care", "neurological outcomes", "neonates", "inadequate care" and "neurodevelopment".

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## *INTRODUCTION*

Adequate prenatal care plays a vital role in maternal and fetal health, ensuring healthy development during pregnancy. This monitoring allows for the early detection of complications, immediate intervention in health problems and the promotion of the general well-being of mother and baby. The lack of quality prenatal care can result in nutritional deficiencies, lack of monitoring of maternal conditions and lack of adequate treatment, factors that can directly impact the neurological development of the fetus.

Neonates whose mothers receive inadequate prenatal care are at a significantly higher risk of developing neurological complications. These complications include delays in motor and cognitive development, increased susceptibility to neurological diseases such as cerebral palsy, and other problems that can have lasting effects on a child's quality of life and overall development. The neurological repercussions can be severe, affecting learning capacity, motor coordination and other skills essential for healthy growth. Understanding these repercussions is essential to emphasize the importance of adequate prenatal care and to develop strategies that can mitigate these risks, thus promoting optimal neurological health in newborns.

The inadequacy of prenatal care is a multifaceted problem, influenced by several factors. Socioeconomic barriers, such as lack of financial resources and difficulty accessing health services, play a crucial role in limiting prenatal care. Furthermore, the lack of knowledge about the importance of prenatal care and cultural issues that can discourage pregnant women from seeking adequate care contribute significantly to this problem. Understanding and addressing these factors is essential to improving access and quality of care during pregnancy.

The implementation of effective public health policies is essential to guarantee universal access to quality prenatal care. These policies should focus on educating pregnant women about the importance of prenatal care, eliminating barriers to accessing health services, and ensuring that all necessary care is provided during pregnancy. Well-structured policy interventions can contribute to reducing disparities in prenatal care and, consequently, improving maternal and neonatal health outcomes.

Studies and scientific articles have clearly demonstrated the relationship

between inadequate prenatal care and neurological repercussions in newborns. The systematic literature review highlights the ongoing need for research to fully understand the mechanisms involved and develop effective interventions. Scientific investigations provide a solid basis for formulating strategies that can significantly improve the neurological health outcomes of newborns, highlighting the importance of quality prenatal care to prevent future complications.

The objective of this systematic literature review is to analyze and synthesize the available evidence on the neurological implications in newborns whose mothers receive inadequate prenatal care. The research seeks to identify factors that contribute to inadequate prenatal care, explore public health policies that can improve access to and quality of prenatal care, and examine scientific studies that demonstrate the relationship between inadequate prenatal care and neurological repercussions in newborns. Furthermore, we intend to highlight the importance of effective interventions to mitigate risks and promote better neurological health outcomes in newborns.

## METHODOLOGY

The methodology of this systematic literature review was developed based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist, aiming to guarantee the transparency and replicability of the study. The databases used for the research were PubMed, Scielo and Web of Science. The descriptors used in the search included "prenatal care", "neurological outcomes", "neonates", "inadequate care" and "neurodevelopment". The inclusion criteria followed were: studies published in the last 10 years, articles that addressed inadequate prenatal interventions and their neurological consequences in newborns, studies available in English, Spanish or Portuguese, research with a robust methodological design (cohort studies, trials clinical studies, case-control studies), and articles that presented quantitative results on the neurological development of newborns.

The exclusion criteria adopted were: studies that were not directly related to the review topic, non-systematic reviews, articles with small samples or that did not present relevant quantitative data, duplicate or redundant publications, and studies that were

not available in full text in the databases. selected data.

To carry out the methodology, firstly, an initial search was carried out in the selected databases using the five defined descriptors. All titles and abstracts of articles found were reviewed to identify potentially eligible studies. The articles that met the inclusion criteria had their full texts analyzed in detail.

The study selection process was conducted by two independent reviewers to minimize bias and ensure accuracy in the inclusion of relevant articles. Any disagreements between reviewers were resolved by consensus or by a third reviewer, when necessary. The data extracted from the studies included information on the quality of prenatal care, characteristics of pregnant women, neurological outcomes of newborns and other variables relevant to the analysis.

This rigorous methodological approach, based on the PRISMA checklist, ensured that the review was comprehensive and based on robust evidence, providing a detailed view of the neurological repercussions in newborns of pregnant women with inadequate prenatal care.

## RESULTS

15 articles were selected. The quality of prenatal care plays a fundamental role in maternal and fetal health, as it ensures adequate monitoring of possible complications during pregnancy. Regular monitoring allows early identification of conditions that may threaten the health of mother and baby, providing the opportunity for preventive and corrective interventions. This includes carrying out clinical and laboratory examinations, evaluating the growth and development of the fetus and monitoring the pregnant woman's health conditions. Furthermore, quality prenatal care offers emotional and educational support to pregnant women, promoting psychological well-being during pregnancy.

Furthermore, adequate prenatal care includes the prescription of nutritional supplementation essential for fetal development, preventing deficiencies that can have negative impacts in the long term. Folic acid supplementation, for example, is crucial for preventing neural tube defects. Thus, continuous monitoring of fetal growth allows early detection of problems, such as intrauterine growth restriction, and enables timely

interventions that improve neurological outcomes in newborns. The preparation and education of pregnant women about the care needed during pregnancy, provided in the context of prenatal care, contributes significantly to adherence to monitoring and to the improvement of health outcomes.

Neonates whose mothers receive inadequate prenatal care are at a significantly higher risk of developing neurological complications. These complications include delays in motor and cognitive development, as well as an increased vulnerability to neurological diseases such as cerebral palsy. This scenario is particularly worrying, as neurological repercussions can have long-lasting and profound effects on the child's quality of life and overall development. The absence of adequate prenatal care can lead to failures in the identification and treatment of conditions that affect neurological development, resulting in adverse outcomes for the newborn.

It is equally important to highlight that neurological complications resulting from inadequate prenatal care not only impact the child's life, but also impose a significant burden on families and the healthcare system. Children with developmental delays or neurological conditions require ongoing specialized care, therapies and educational support, which can create financial and emotional challenges for families. Therefore, preventing these complications through quality prenatal care is essential not only for the immediate health of newborns, but also to ensure healthy and balanced development in the long term.

Inadequacy of prenatal care is often influenced by a variety of socioeconomic and cultural factors that limit pregnant women's access to necessary care. Firstly, a lack of financial resources prevents many women from seeking regular medical care during pregnancy, resulting in insufficient or no monitoring. Difficulties in accessing health services, especially in rural areas or urban outskirts, worsen this situation, as the distance and lack of adequate transportation make visits to the doctor a challenging task. Furthermore, the shortage of qualified health professionals in certain regions contributes to the low quality of available prenatal care.

Additionally, the lack of knowledge about the importance of prenatal care plays a crucial role in pregnant women's insufficient adherence to adequate monitoring. Many women are not aware of the benefits of well-managed prenatal care, which results in

underutilization of available services. Cultural and social issues can also negatively influence this adherence, as certain communities may have beliefs and practices that discourage women from seeking medical care during pregnancy. Therefore, it is essential to address these factors through education and awareness campaigns that inform pregnant women about the importance of prenatal care and promote behaviors that ensure a healthy pregnancy.

The implementation of effective public policies is crucial to ensure that all pregnant women have access to quality prenatal care, regardless of their socioeconomic conditions. Policies aimed at educating pregnant women about the importance of prenatal care are essential, as they increase awareness and encourage adherence to necessary care during pregnancy. Furthermore, eliminating barriers to accessing health services, such as offering free transportation or subsidies for medical appointments, can significantly facilitate the search for regular monitoring.

Ensuring that prenatal care is widely available and accessible also requires the training and adequate deployment of qualified health professionals in all regions, including the most remote ones. Therefore, policies that encourage the work of doctors and nurses in needy areas, through financial and career incentives, are essential to ensure that all pregnant women receive the necessary support. Additionally, integrating maternal health programs with other social services can provide comprehensive support to pregnant women, addressing not only their medical needs but also their living conditions, thus promoting an environment more conducive to a healthy pregnancy.

Scientific evidence and studies play a fundamental role in understanding the neurological repercussions in newborns resulting from inadequate prenatal care. Several studies clearly demonstrate the relationship between the quality of prenatal care and the neurological outcomes of newborns. These studies, conducted in various parts of the world, provide quantitative and qualitative data that elucidate the mechanisms by which insufficient prenatal care can lead to neurological complications. For example, longitudinal studies that follow children from birth to childhood show that those whose mothers did not receive adequate prenatal care have higher rates of delays in motor and cognitive development, in addition to an increased incidence of serious neurological conditions, such as cerebral palsy.

Furthermore, systematic literature reviews and meta-analyses consolidate this evidence by bringing together and analyzing the results of multiple studies, providing a comprehensive and robust view of the topic. These reviews consistently indicate that appropriate interventions during pregnancy, including nutritional supplementation, fetal monitoring, and treatment of maternal conditions, are essential to prevent adverse outcomes. Thus, scientific evidence not only confirms the importance of quality prenatal care, but also highlights the need to continue researching and developing interventions that can be implemented effectively in different socioeconomic and cultural contexts.

Based on these studies, it is imperative that health policymakers consider this evidence when planning and implementing maternal health programs. Scientific discoveries should guide the allocation of resources and the creation of strategies to ensure that all pregnant women have access to quality prenatal care. This includes not only strengthening health systems, but also implementing educational campaigns that reach vulnerable populations and disseminate information about the importance of prenatal care.

Therefore, the role of scientific evidence is twofold: it informs clinical practice and policymaking, while also identifying areas where further research is needed to fill gaps in knowledge. Therefore, the continued development of rigorous and well-conducted studies is essential to improve prenatal practices and improve the neurological outcomes of newborns, thus ensuring a healthy and promising start to life for all children.

Nutritional supplementation during prenatal care plays a crucial role in the healthy neurological development of newborns. Pregnancy is a period in which a woman's nutritional needs increase significantly, and the deficiency of certain nutrients can have adverse repercussions on the fetal brain development. For example, adequate folic acid intake is essential for preventing neural tube defects, a serious condition that affects the development of the brain and spinal cord. Furthermore, iron deficiency during pregnancy can lead to maternal anemia, which in turn can negatively impact oxygen supply to the fetus, affecting its neurological development.

Monitoring fetal growth during prenatal care is an essential practice to early identify possible problems that could affect the baby's neurological development.

Obstetric ultrasound, for example, allows the assessment of fetal size and development, identifying conditions such as intrauterine growth restriction. Detecting these conditions early allows timely interventions, such as adjusting the pregnant woman's diet, more frequent monitoring or, in more serious cases, inducing premature birth to avoid damage to the neurological development of the fetus. Furthermore, regular monitoring of maternal blood pressure and blood glucose during prenatal visits is crucial to identify and treat conditions such as gestational hypertension and diabetes, which can have adverse impacts on the newborn's neurological development. Therefore, careful monitoring of fetal growth not only improves neonatal outcomes, but also provides pregnant women with peace of mind that their baby is developing appropriately.

Educating pregnant women about the importance of prenatal care plays a crucial role in promoting healthy practices during pregnancy. Informing and guiding women about the necessary care not only raises awareness about the benefits of prenatal care, but also empowers pregnant women to make informed decisions about their health and that of their baby. For example, educational programs that address topics such as proper nutrition, weight control, recommended physical exercise, and warning signs during pregnancy can help pregnant women adopt behaviors that promote healthy neurological development in the fetus.

Adequate treatment of maternal conditions during prenatal care is essential to prevent complications that can affect the newborn's neurological development. For example, effectively controlling gestational hypertension can reduce the risk of preeclampsia, a condition that can lead to serious complications for both mother and baby, including neurological problems. Likewise, careful management of gestational diabetes through diet, blood glucose monitoring and, when necessary, appropriate medication, is crucial to minimize adverse effects on the neurological development of the fetus. Furthermore, early identification and treatment of other maternal conditions, such as infections and endocrine disorders, can significantly contribute to ensuring a healthy intrauterine environment conducive to adequate neurological development of the neonate. Therefore, integrated treatment of maternal conditions during prenatal care not only promotes maternal health, but is also essential to ensure a good neurological prognosis for the newborn.

The implementation of early interventions is essential to mitigate the risks associated with inadequate prenatal care and promote better neurological health outcomes in newborns. These interventions may include intensive follow-up programs after birth, which monitor children's neurological and motor development from the first months of life. For example, early stimulation therapies can be started in the first few months to promote cognitive and motor development, helping to compensate for possible delays caused by poor prenatal care.

Furthermore, family support strategies are essential to provide a stable and stimulating environment for the neurological development of children affected by inadequate prenatal care. Parental involvement in educational programs that address specific care for infants at neurological risk can significantly improve long-term outcomes. These programs not only empower parents to recognize early signs of abnormal development, but also offer strategies to support their children's ongoing development. Additionally, access to mental and psychological health services for families in stressful situations can help reduce the emotional impact of facing early neurological challenges. Therefore, by investing in early interventions and family support, it is possible to improve prognoses for children facing complications due to inadequate prenatal care, promoting healthy neurological development and maximizing their life potential.

## CONCLUSION

Based on the scientific evidence reviewed, it is concluded that pregnant women with inadequate prenatal care face a greater risk of neurological repercussions in newborns. Studies highlight that the quality of prenatal care not only influences the physical and neurological development of the fetus, but also directly affects the long-term health outcomes of children. The absence of adequate monitoring during pregnancy is associated with complications such as delays in motor and cognitive development, as well as an increased incidence of serious neurological conditions, including cerebral palsy.

The importance of prenatal care goes beyond simple medical monitoring; includes educating pregnant women about proper nutrition, controlling maternal

conditions such as hypertension and diabetes, and promoting preventive health practices. The lack of access to health services and socioeconomic barriers are identified as the main causes for inadequate prenatal care, highlighting the urgent need for public policies that guarantee equity in access to quality prenatal care.

Early interventions and family support are essential to mitigate the adverse effects of inadequate prenatal care, improving neurological outcomes and global development of affected children. Investments in continuing education for health professionals and public awareness programs are needed to strengthen maternal and newborn health systems, ensuring that all pregnant women receive the support they need for a healthy pregnancy and a promising start in life for their children.

Therefore, it is concluded that improving the quality of prenatal care is not only a matter of individual health, but also a crucial measure to promote public health and the well-being of future generations. Continuing scientific research and implementing effective policies are essential to address existing challenges and ensure a healthier, more equitable future for mothers and babies around the world.

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