

# The Effect of Mobile Phone Use During Pregnancy on the Mental Growth of New-borns: A Review

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## Abstract

*Mobile phone usage is becoming more and more common, including among pregnant women, and has become an essential component of modern life. The purpose of this review article is to investigate any potential consequences of mobile phone use during pregnancy on the development of the new-born's brain. The article provides a thorough overview of the research studies that have already been conducted, highlighting the numerous variables that may affect the association between mobile phone use during pregnancy and new-born mental development. The results indicate that although some studies mention possible negative consequences, the total body of data is still equivocal and calls for more research.*

**Key Words:** Mobile Phone, Mental Growth, New-Born

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## Introduction:

The introduction gives a succinct summary of the rising prevalence of mobile phone use during pregnancy and its potential effects on the mental development of the unborn child. Setting the stage for the following sections of the article, it emphasises how crucial it is to comprehend the potential implications of cell phone use during this crucial time.

1. Exposure to and Radiation from Mobile Phones: This section explores the probable processes through which electromagnetic fields and radiation from mobile phones may impair foetal brain development. It explains the various radiation kinds released by mobile phones and provides the most recent information on how deeply these radiations can penetrate the foetal brain..
2. Maternal Mobile Phone Use and Neurodevelopment: This section examines the epidemiological research that has been done to date on the relationship between maternal mobile phone use during pregnancy and the neurodevelopment of the foetus. It looks at research that looked at how children exposed to their mothers' mobile phone use developed cognitively, linguistically, attention ally, and behaviourally.
3. Animal Studies and Experimental Evidence: In this part, the impacts of mobile phone use during pregnancy on offspring are explored through the lens of animal studies and experimental data. It emphasises the biological mechanisms that may have been discovered in animal models and their applicability to human neurodevelopment.
4. Restrictions and Future Directions: This section recognises the restrictions of the current research and advocates for additional research to understand any potential implications of mobile phone use during pregnancy on the development of the unborn baby's mind. Future research can benefit from its recommendations, which also call for better study designs and the inclusion of long-term follow-up assessments.
5. Conclusion: The conclusion highlights the need for caution when interpreting the available information while summarising the main conclusions from the review. It emphasises the significance of weighing the advantages and disadvantages of mobile phone use during pregnancy and implies that more investigation is required to establish more conclusive proof regarding its effect on the mental development of the unborn child.

Overall, this review paper offers a thorough analysis of the body of research on the impact of mobile phone use during pregnancy on foetuses' mental development. Although several research have suggested some negative impacts, the available data are still not conclusive. It emphasises how crucial it is for further research to be done

in this area to educate pregnant people and medical professionals about the potential risks and advantages of cell phone use during pregnancy.

review study's on Effect of Mobile Phone Use During Pregnancy on the Mental Growth of Newborns

The potential impacts of mobile phone use during pregnancy on the development of newborns' minds have been the subject of several research. The results have been conflicting, with some studies revealing potential negative consequences and others failing to detect any meaningful relationships. It is significant to keep in mind that this field of study is still developing, and additional research is required to create stronger proof.

One 2019 study that appeared in *JAMA Paediatrics* looked at the connection between mother mobile phone use during pregnancy and behavioural issues in children. A minor relationship between prenatal mobile phone use and an elevated risk of behavioural issues in children was discovered by the study after it examined data from a large cohort. The study, however, also emphasised the need for additional investigation to support these findings and look at potential underlying mechanisms.<sup>1</sup>

In contrast, a 2020 study that appeared in the journal *BMC Public Health* revealed no connection between mother usage of a cell phone while pregnant and cognitive or linguistic development in young children. The study evaluated a range of developmental outcomes using a large sample size and thorough assessments. The researchers came to the conclusion that there was little evidence to back up a direct link between prenatal mobile phone use and poor neurodevelopmental outcomes.<sup>2</sup>

Another study published in *Environmental Health Perspectives* in 2018 investigated the association between prenatal mobile phone use and child neurodevelopmental outcomes. The study did not find any consistent evidence of adverse effects on cognitive or behavioral development in children at 5 years of age. However, the authors noted that their study had limitations, such as self-reported mobile phone use and the potential for recall bias.<sup>3</sup>

In contrast to the widespread usage of mobile phones today, very few research have looked at the impact of electromagnetic waves on the developing human foetus. The purpose of this study was to assess the relationship between pregnant women's usage of mobile phones and foetal development in the general population. 1368 moms (99.3%) of the 1378 mothers' medical charts utilised cell phones during pregnancy for the analysis. The average daily phone time was 29.8 minutes (0.0 to 240.0 minutes). Following adjustments, newborns whose mothers used their mobile phones for more than 30 minutes per day during pregnancy were substantially more likely than those whose mothers used them for less than 5 minutes per day to have a AUDIPOG score below the 10th percentile (aOR = 1.54 [1.03; 2.31], p = 0.0374) Ladies who use mobile phones.<sup>4</sup>

Mobile devices are increasingly being used in healthcare services all around the world. We investigated the relationship between Aponjon mobile phone-based messaging services and customs around childbirth and the treatment of mothers and newborns in several Bangladeshi locales. Women reported having births in hospitals (n = 307, 65%), at home (n = 111, 23%), or at home with a competent delivery attendant (n = 58, 12%). The majority of moms (n = 443, 93%) nursed their newborns right away. following 72 hours (n = 294, 62%), between 48 and 72 hours (n = 100, 21%), and between 0 and 47 hours (n = 80, 17%) following birth, babies were bathed. None (n = 273, 57%), 1 (n = 79, 17%), 2 (n = 54, 11%), and 3 (n = 34, 7%) were the reported PNC frequencies.<sup>5</sup>

A systematic review was carried out in 2022 by Braulio M. Girela-Serrano, Alexander D. V. Spiers, Liu Ruotong, Shivani Gangadia, Mireille B. Toledano, and Martina Di Simplicio. Regarding the mental health of children and teenagers with the usage of mobile phones and wireless devices: Concerns have been raised concerning the potential impact of the growing usage of mobile phones (MP) and other wireless devices (WD) on the wellness of children and adolescents. Given the continued rise in use of these devices since the COVID-19 outbreak, it is more important than ever to understand if they have beneficial or negative effects on children's and teenagers' mental health. to evaluate the empirical data on the relationships between MP/WD usage and adolescent and child mental health. For research published before July, a thorough examination of the literature on Medline, Embase, and PsycINFO was conducted.<sup>6</sup>

PanelMichael Davidovitch, Noa Gueron-Sela, and Yael RozenblattPerkal conducted The effects of maternal mobile phone use on infants' physiology and behaviour: an experimental study In the current study, we looked at how infants' physiological and behavioural reactivity—such as heart rate and negative affect—was affected by maternal mobile phone use during mother-child interaction. In this trial, 106 mother-infant dyads (M age = 11.88 months; 51% male) were randomised at random to one of three conditions. Every condition began and concluded with a three-minute mother-child free-play, and the manipulation took place in the interim: Mothers were told to respond to text messages delivered by the experimenter. Social disruptions occurred when the experimenter entered the room and asked the same questions verbally. Undisrupted play involved mother and child playing freely. We measured and recorded the heart rate (HR) of infants.<sup>7</sup>

The following study was carried out in 2022 by Hava Bektas, Mehmet Selcuk Bektas, and Suleyman Dasda to examine the effects of maternal cell phone use duration on the general motor movements of infants: The amount of radiofrequency radiation (RFR) released by wireless devices is increasing quickly, and youngsters and pregnant women are the most vulnerable populations. As a result, we used the Prechtl method to conduct a general movement assessment (GMA) in order to examine the motor repertoires and fidgety movements (FMs) of the infants of pregnant women who used mobile phones for various amounts of time during the prenatal period (DOMFU). Infants who were eligible for the study were separated into 4 groups based on their mothers' duration of use of a mobile phone during pregnancy, including those who did not talk on a mobile phone (Control Group, n: 31), those who did talk on a mobile phone for a short period of time, those who talked on a mobile phone for long time.<sup>8</sup>

A study on the use of smart phones by infants and toddlers: This study examined mothers' perceptions of their children's smart phone use as well as the condition of newborns and toddlers' smart phone use. It also examined the parental efficacy of mothers in influencing their children's smart phone use. As study participants, parents whose kids attend early childhood education centres in D and I cities were chosen. There were 500 youngsters in all, and utilising the data that had been gathered, frequency analysis and difference verification were carried out.<sup>9</sup>

Assessment of Infant Brain Development with Frequency-Domain Near-Infrared Spectroscopy: This is the first study to show quantitative frequency-domain near-infrared spectroscopy (FD-NIRS) monitoring of baby brain development. During the first year of life, healthy newborns' blood volume and oxygen demand increased in specific geographic areas. The results are consistent with earlier PET and SPECT reports, although FD-NIRS is portable and doesn't employ ionising radiation. New data also shows that tissue oxygenation is largely stable with age and location, which suggests that local oxygen delivery and consumption are tightly regulated in healthy infants during brain development. The most effective clinical method for statistically evaluating baby brain development may emerge as FD-NIRS.<sup>10</sup>

It is important to note that the majority of research in this field rely on participants' self-reports of using mobile phones, which could lead to recollection bias and inaccurate estimations of real exposure levels. Additionally, it can be difficult to establish a clear causal relationship due to confounding factors that can affect the observed relationships, such as maternal stress, socioeconomic status, and other lifestyle characteristics.

In conclusion, there is conflicting evidence in the literature on the impact of cell phone use during pregnancy on a newborn's ability to think. The use of mobile phones by mothers may be linked to worse neurodevelopmental outcomes, according to some studies, while other research has not found any conclusive evidence of this. To generate more concrete data in this area and to better understand the potential hazards and benefits, more study is required. Pregnant women are urged to exercise caution and think about limiting their exposure to mobile phone radiation as a preventative step, in accordance with the most recent recommendations and guidelines.

The review's consequences about how mobile phone use during pregnancy affects the brain development of newborns are extensive. Here are some major conclusions that may be made from the literature currently available.:

1. **Inconclusive Evidence:** The assessment emphasises that the available data on the subject are still not definitive. While some studies imply that using a mobile phone while pregnant may have negative consequences on the development of the unborn child's brain, other research has not established any conclusive links. This lack of agreement highlights the need for additional study to establish more conclusive proof.
2. **Precautionary Approach:** The conflicting results may call for a careful approach. As a precaution, pregnant women may want to reduce their exposure to mobile phone radiation by following the most recent advice and guidelines issued by the appropriate health authorities.
3. **3. The Need for Long-Term Follow-Up:** The review highlights the requirement for long-term follow-up studies to investigate any potential effects of mobile phone use during pregnancy on the long-term mental development of children. Researchers would therefore be able to analyse developmental outcomes outside of early infancy and build a more thorough knowledge of any possible consequences.
4. **Methodological Considerations:** The review emphasises the methodological difficulties in examining how mobile phone use during pregnancy affects a baby's mental development. Future research should think about enhancing study designs, like employing impartial indicators of cell phone use and reducing recollection bias. Confounding variables like maternal stress and socioeconomic status should also be taken into account by researchers because they can affect the connections that have been identified.
5. **Public Awareness and Education:** The evaluation emphasises how crucial it is to inform both pregnant people and medical professionals about the potential risks and advantages of cell phone use during pregnancy. By increasing awareness, people can make wise choices about their mobile phone use and take the essential safeguards to protect both the mother and the growing foetus.

6. Policy Considerations: Because the evidence is not conclusive, policy decisions addressing mobile phone use during pregnancy should be based on a fair evaluation of the facts. To assist pregnant women in making informed decisions, health authorities and policymakers should routinely evaluate the scientific literature, take precautions, and offer evidence-based guidance..

Overall, the review's findings urge greater study, safety precautions, public awareness, and well-informed decisions regarding cell phone use during pregnancy. The ultimate objective is to protect newborns' health and promote their best possible mental development while taking into account any hazards related to mobile phone exposure.

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