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*Original article*

# Exploring the Relation Between Maternal Vitamin Intake and Child Development

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**Abstract**
Good nutrition during pregnancy is very important for the baby's growth and health before and after birth. This study examined how taking vitamins during pregnancy affects the child's development. We asked 40 mothers about their vitamin intake, health during pregnancy, and their children's growth. We found that 90% of the mothers took vitamins, and most of them started in the first three months of pregnancy. Almost all the children (98%) were born with a normal weight, and 95% showed normal development in movement and language in their first two years. However, 40% of the mothers had anemia, which shows that more attention is needed for iron intake during pregnancy. We also found that mothers who started taking vitamins later in pregnancy (after the first three months) or had anemia were more likely to have children with anemia or weaker immunity in early childhood. These results highlight the importance of educating mothers about nutrition during pregnancy and improving healthcare services to ensure mothers and children stay healthy.
**Keywords**. Maternal Nutrition, Vitamin Supplementation, Child Development, Anemia in Pregnancy.

## Introduction

Good nutrition during pregnancy is very important for the health and growth of the baby, both before and after birth. Vitamins like folic acid, vitamin D, iron, and calcium play a big role in helping the baby's brain, immune system, and overall development. However, some mothers do not take vitamins seriously, thinking that skipping them will not harm their child [1].

Previous studies have shown how important vitamins are during pregnancy. For example, Zhao et al. [1] found that mothers who lack vitamin B12 are more likely to have children with delayed mental and physical development. Smith et al. [2] also showed that taking folic acid during pregnancy reduces the risk of birth defects by 70%. Jones et al. [3] found that mothers with enough vitamin D have healthier babies with better birth weight. Additionally, Wiegersma et al. [4], showed that poor maternal nutrition during early pregnancy, such as during the Dutch Famine, can lead to long-term effects on brain function and increase the chances of health problems later in life. This study aims to understand how taking vitamins during pregnancy affects the baby's health and development, especially regarding birth weight, movement, language, and immunity. The results will help improve healthcare services and raise awareness about the importance of nutrition during pregnancy.

## Methods

### *Study design and setting*

This study used a cross-sectional descriptive design to collect data from 40 mothers. We asked them about their nutrition, health during pregnancy, and their children's growth, using a questionnaire designed specifically for this study to collect data on maternal nutrition, health during pregnancy, and child development. We focused on mothers who had at least one child aged 0–5 years to study early child development.

### *Sampling method*

We selected 40 mothers from different areas (both city and countryside), different ages, and different education levels to make sure the group was diverse.

### *Data collection tool*

The questionnaire had five parts: 1) Basic Information: Age, number of children, education level, and where they live. 2) Vitamins During Pregnancy: What vitamins did they take, and when did they start? 3) Maternal Health: Whether they have anemia or other health issues. 4) Child Development: The child's birth weight, anemia, and milestones like walking and talking. 5) Lifestyle: Their diet, exercise, smoking, and stress during pregnancy.

### *Data Analysis*

Descriptive Statistics: Percentages and averages summarize the data. Relationships between key variables, such as maternal education and vitamin intake, were examined. Associations between maternal behaviors (e.g., diet, exercise) and child development outcomes were analyzed.


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### *Ethical considerations*

All mothers agreed to participate voluntarily, and their information was kept private. The study followed ethical guidelines for research.

## Results

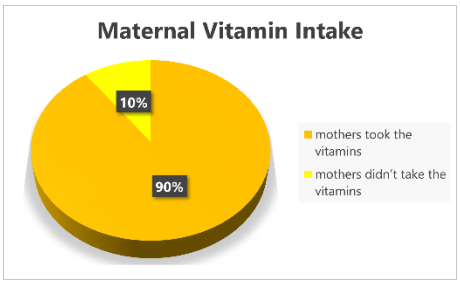
The study revealed several key findings regarding maternal vitamin intake and its impact on child development. The results are summarized in Table 1 and Figures 1–2.

***Table 1. Summary of Key Findings***

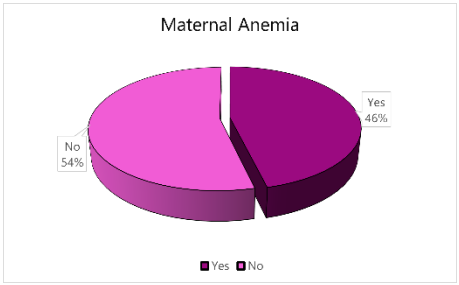
| Category | Percentage | Details |
|---|---|---|
| Mothers Taking Vitamins | 90% | 70% started in the first trimester, 20% in the second trimester, 29% of the mothers reported taking only folic acid during pregnancy |
| Childbirth Weight | 98% | Normal birth weight |
| Child Development | 95% | Normal motor and language development in the first two years |
| Maternal Anemia | 40% | Highest occurrence in the second trimester |
| Child Anemia | 18% | 83% did not experience anemia |
| Side Effects | 11% | Mild side effects: constipation, gastritis, nausea (33% each) |

*Data collected from a survey of 40 mothers at Zawiya Teaching Hospital, 2025.*

Table 1 presents a summary of the main findings of the study. It includes the percentage of mothers who took vitamins, timing of intake, rates of normal birth weight and child development, and the prevalence of anemia and side effects during pregnancy.




(**a**) Figure 1a shows that 90% of mothers took vitamins during pregnancy, with 70% starting in the first trimester




(**b**) Figure 1b shows that 40% of mothers experienced anemia during pregnancy, with the highest occurrence in the second trimester.

***Figure 1. Maternal Health and Vitamin Intake.***

## Discussion

The findings of this study are consistent with previous research on maternal nutrition and child development. The high percentage of mothers taking supplements (90%) aligns with global trends that emphasize the importance of prenatal nutrition for both maternal and child health. This observation agrees with earlier findings highlighting the growing awareness among pregnant women regarding the benefits of supplementation [5,6].

Interestingly, 40% of the mothers in our study experienced anemia during pregnancy, which raises concerns about iron deficiency despite reported supplement use. This issue aligns with recent evidence from Wiegersma et al. [4], which emphasized the long-term cognitive effects of prenatal undernutrition. It underlines the importance of not just taking supplements, but ensuring they are well-targeted and taken early enough to have a meaningful impact. Similar conclusions were also noted by Hasan et al. [7].

The high percentage of children born with normal weight (98%) in our findings supports conclusions drawn by Jones & White [3], who linked vitamin D adequacy with healthier birth outcomes. Similar results were observed in the systematic review by Tareke et al. [8], which found that vitamin D intake during pregnancy significantly contributed to improved growth indicators in under-five children. Furthermore, recent meta-analyses by Huang et al. [9] have reinforced the importance of vitamin D in preventing intrauterine growth restriction.

Our results also showed that mothers living in urban areas and those with higher education levels were more likely to take vitamins regularly. This pattern reflects broader trends noted by Ahmed et al [10] who found that socioeconomic status, education, and healthcare access play a pivotal role in determining maternal health behaviors during pregnancy. A similar pattern was documented in a study by Khan et al [11], which highlighted how community-based health education improved supplement adherence.

Child development outcomes in our study were mostly positive, with 95% of children showing normal motor and language development. This is consistent with findings by Zhou et al. [12], who reported that folic acid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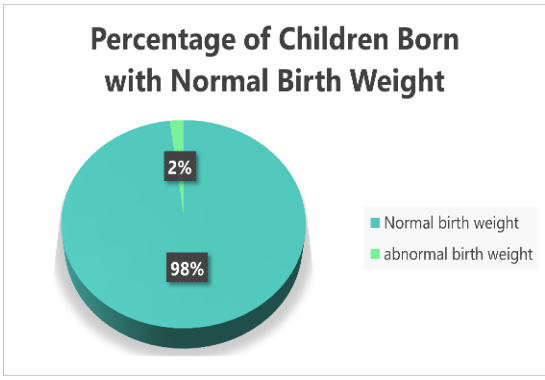
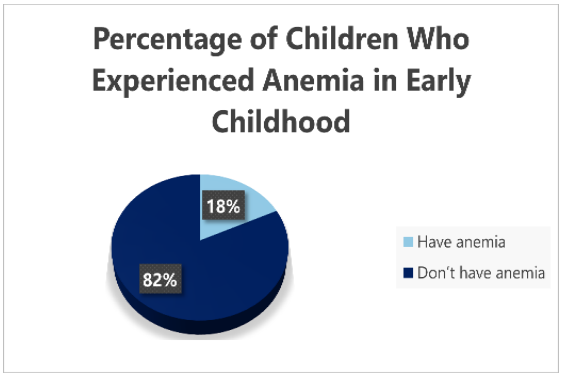
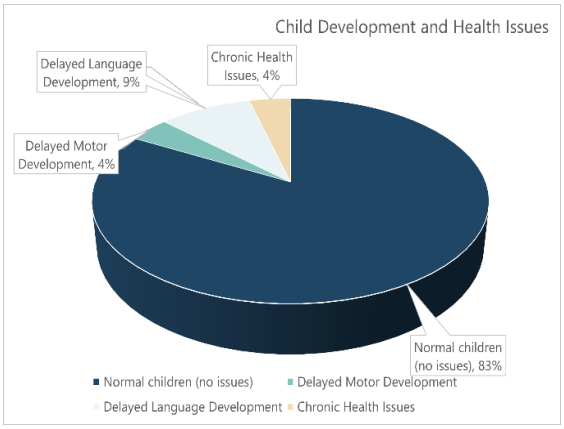
supplementation is linked not only to a reduction in neural tube defects but also to improved neurodevelopmental outcomes. Furthermore, Zhao et al. [1] reported a strong association between maternal vitamin B12 levels and neurological development during early childhood. Similarly, Smith and Brown [2] found that folic acid intake during early pregnancy reduces the risk of neural tube defects by up to 70%. Other studies, such as Rivera et al. [13], have confirmed the importance of iodine intake in supporting early speech and motor function.




(**a**)Figure 2a shows that 98% of children were born with a normal birth weight.




(**b**)Figure 2b shows that 18% of children experienced anemia in early childhood.




(**c**) Figure 2c shows the percentage of children with delayed language development (9%), delayed motor development (4%), and chronic health issues (4%).

***Figure 2. Child Development and Health Outcomes***

Additionally, Lin et al. [14] explored how micronutrient intake during pregnancy influences gene expression and may play a preventative role against long-term developmental disorders. The concept of nutrigenomics continues to gain traction, with Ortega et al. [15] demonstrating how maternal intake of nutrients such as folate and iodine can influence fetal epigenetic programming. This supports the need for a more personalized approach to prenatal care, considering both genetic and environmental factors. Moreover, Tran et al. [16] highlighted how persistent iron deficiency in pregnancy remains a widespread issue, despite supplementation programs, which echoes the 40% anemia rate observed in our cohort.

Limitations of this study include the small sample size, which may limit generalizability, and reliance on self-reported data that could introduce recall bias. The absence of follow-up data also restricts our understanding of long-term child health outcomes. Nevertheless, the findings provide a foundation for future research into maternal nutrition's sustained effects. Overall, our results reaffirm the crucial role of early and adequate maternal vitamin intake in promoting favorable pregnancy outcomes and child development. Ongoing education, equitable healthcare access, and further investigation into genetic-nutritional interactions are recommended.

## Conclusion

Vitamin supplementation significantly affects child development, with 98% of children born at a normal weight and 95% showing healthy development. However, anemia remains a concern, affecting 40% of pregnant women, which necessitates improved iron supplementation strategies. Emerging research in nutrigenomics highlights how maternal nutrition, including key vitamins like folic acid, vitamin B12, vitamin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D, and iodine, can influence gene expression and play a crucial role in preventing birth defects and chronic diseases. These findings underscore the importance of proper nutrition during pregnancy for regulating gene function, preventing birth defects, and ensuring healthy child development.

### *Ethical approval*

The study was approved by the Ethics Committee of the Department of Family and Community Medicine, Faculty of Medicine, Zawia University, and Al-Zawiya Medical Center (2025). All procedures involving human participants were conducted following the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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### *Conflicts of Interest*

The authors declare no conflicts of interest.

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**المستخلص**

تُعد التغذية الجيدة أثناء الحمل عاملًا أساسيًا في دعم نمو الجنين وصحته قبل الولادة وبعدها. تهدف هذه الدراسة إلى استكشاف العلاقة بين تناول الفيتامينات خلال فترة الحمل وبين نمو وتطور الطفل خلال السنوات الأولى من عمره. تم إجراء الدراسة على عينة مكونة من 40 أمًا، حيث تم جمع معلومات حول تناول الفيتامينات، والحالة الصحية للأم أثناء الحمل، بالإضافة إلى مؤشرات نمو الطفل بعد الولادة. أظهرت النتائج أن 90% من الأمهات تناولن الفيتامينات، وكانت الغالبية قد بدأن في الثلث الأول من الحمل. وُلد 98% من الأطفال بوزن طبيعي، وأظهر 95% منهم تطورًا طبيعيًا في المهارات الحركية واللغوية خلال أول عامين. ومع ذلك، أُصيبت 40% من الأمهات بفقر الدم، مما يشير إلى وجود نقص في تناول الحديد أثناء الحمل. كما لوحظ أن الأطفال الذين كانت أمهاتهم يعانين من فقر دم أو بدأن بتناول الفيتامينات في وقت متأخر، كانوا أكثر عرضة لفقر الدم أو ضعف المناعة في مرحلة الطفولة المبكرة. تؤكد هذه النتائج على أهمية التثقيف الغذائي للنساء الحوامل وتحسين جودة خدمات الرعاية الصحية لضمان صحة الأمهات والأطفال.


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