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Efficiency of Vitamin A Supplementation in Relation to Morbidity and Mortality in Children Aged 6 to 59 Months: An Integrative Review

Efficiency of Vitamin A Supplementation in relation to Morbidity and Mortality in Children from 6 to 59 Months: An Integrative Review

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Summary

Introduction: Vitamin A deficiency is one of the main preventable causes of childhood morbidity and mortality in developing countries, and for this reason vitamin A supplementation programs were created. Studies show that vitamin A supplementation reduces mortality risk by 12%. **Objective:** To evaluate the effectiveness of vitamin A supplementation in reducing morbidity and mortality in children aged 6 to 59 months. **Methodology:** This article is characterized as an integrative review of recent scientific literature. Articles published between 2020 and 2025 in the PubMed, SciELO and CAPES Periodicals databases were selected, using keywords such as “hypovitaminosis A”, “infant mortality” and “supplementation”. **Results and Discussion:** The results indicate that supplementation with megadoses of vitamin A is associated with a reduction of up to 24% in infant mortality. The review also highlights the risks of hypervitaminosis A, reinforcing the importance of correct dosage and supervision of public health policies. **Conclusion:** It is concluded that vitamin A supplementation is an effective and necessary strategy for promoting child health, especially in underdeveloped countries due to lack of access due to geographic or financial reasons, and should be integrated with educational and nutritional actions to ensure its sustainable impact.

Keywords: Vitamin A. Infant mortality, Supplementation, Nutritional deficiency, Public health, Night blindness, Diarrhea. Measles.

Abstract

Introduction: Vitamin A deficiency is one of the leading preventable causes of child morbidity and mortality in developing countries, which led to the creation of vitamin A supplementation programs. Studies show that vitamin A supplementation reduces the risk of mortality by 12%. **Objective:** To evaluate the effectiveness of vitamin A supplementation in reducing morbidity and mortality in children aged 6 to 59 months through an integrative review of recent scientific literature. Articles published between 2020 and 2025 were selected from the PubMed, SciELO, and CAPES Journals databases using keywords such as “vitamin A deficiency,” “child mortality,” and “supplementation.” **Methodology:** The results indicate that high-dose vitamin A supplementation is associated with up to a 24% reduction in child mortality, particularly in cases of diarrhea, measles, and visual impairments such as night blindness. The review also highlights the risks of hypervitaminosis A, highlighting the importance of proper dosage and supervision in public health policies. **Conclusion:** It is concluded that vitamin A supplementation is an effective and necessary strategy for promoting child health, especially in underdeveloped counties where access to food sources of the nutrient is limited due to geographic or financial constraints. It should be integrated with educational and nutritional actions to ensure sustainable impact.

Keywords: Vitamin A, Child mortality, Supplementation, Nutritional deficiency, Public health, Night blindness, Diarrhea, Measles.

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Introduction

Vitamin A deficiency represents a public health challenge on a global scale, with a higher incidence in developing nations, such as Brazil and several countries in the con- African ethnic group. (WORLD HEALTH ORGANIZATION, 2023). This fact can probably be due to the distribution of income in these places, it does not favor the poorest populations. des, and because of this, child malnutrition persists (IMDAD et al; 2022).

Vitamin A deficiency has a multifactorial etiology, associated with diverse patterns. distribution processes, such as inadequate intake of foods that are sources of the vitamin, weaning early, high incidence of infections and precarious socioeconomic conditions and lack of food ments, as occurs with those who live in rural areas (FERREIRA; OLIVEIRA; SILVA, 2020). The prognosis for children with severe disabilities can be serious, leading to complications such as irreversible blindness, increased susceptibility to infectious diseases and until death (BRAZIL, 2023).

Established by Ordinance No. 729, on May 13, 2005, the National Supplement Program Vitamin A Supplementation (PNSVA) has as its central purpose to address vitamin A deficiency A in the Brazilian population. The initiative focuses on reducing morbidity and mortality rates among children aged 6 to 59 months, as well as in women in the postpartum period, priority using regions that present greater social and nutritional fragility, it is offered free of charge in health units. In 2012, the program was expanded to include all children of the target age group living in the North and Northeast Regions, in addition to several municipalities in the Central-West, South and Southeast regions, also including the 34 Special Health Districts. Indigenous Peoples. (BRAZIL; 2025).

Studies show that vitamin A supplementation reduces the risk of death by 12%. all-cause mortality and diarrhea mortality (IMDAD, A. *et al;* 2017). The predomi- The incidence of vitamin A deficiency in Brazil is 6.4%, being higher in the Central-West region (11.5%) and lower in the Southeast (5%), according to the Ministry of Health (Enani;2019).

Vitamin A supplementation can significantly reduce morbidity and mortality infant, preventing diseases such as diarrhea and improving children's immune status, according to a study by Ramadhan et al. (2023), vitamin A supplementation in children aged 6 to 59 months had a positive impact on reducing morbidities such as diarrhea and contributed significantly to the improvement of child nutritional status in Indonesia, and presented a

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30% reduction in mortality cases in cases of vitamin A hypovitaminosis. This way, understand the impact of vitamin A supplementation on reducing morbidity and mortality children is essential to support and strengthen public health policies.

In this context, this work aims to investigate the effectiveness of vitamin A supplementation in reducing morbidity and mortality in children aged 6 to 59 months, through a systematic review of recent scientific production.

METHODOLOGY

The current research is characterized as an integrative bibliographic review study, descriptive and exploratory characteristics. The study followed the problem question: “Effective Science of Vitamin A Supplementation in Relation to Morbidity and Mortality in Children Aged 6 to 59 Months: An Integrative Review”. The data search took place in the following scientific databases: National Library of Medicine (PubMed); CAPES periodicals, and Scientific Electronic Library Online (SciELO), Ministry of Health. With the following Descriptors: Vitamin hypovitaminosis A, social inequality, accessibility, diarrhea, infant mortality.

Keywords used in Portuguese and English were vitamin hypovitaminosis AND, and as an inclusion factor, followed the studies of articles from primary sources of information. tions in English and Portuguese. The cut-off period was 5 years, between 2020 to 2025, with the aim of using more current research. Published works were included published in scientific journals that dealt with the effects of vitamin A supplementation in children aged 6 to 59 months, and death caused by deficiency of this vitamin in children and as supplementation of this nutrient impacts the prevention of infant mortality.

The following were excluded: monographs, reviews, editorials, opinions and duplications. The following were considered: considered studies covering mortality from diarrhea, as long as they mentioned (DVA). The data collection followed the following steps: initially, the central theme of the study was defined, followed by the delimitation of inclusion and exclusion criteria. Subsequently, the sequential reading of the titles, followed by analysis of the abstracts, and finally, reading full version of the selected articles.

The search for the descriptor DVA *(vitamin A deficiency)* in the databases resulted in a total number of articles. Of these, 3,906 met the previously established inclusion criteria. After applying the exclusion criteria mentioned above, 100 articles remained. The titles were then read sequentially, excluding those that were not related. on the theme of the study, resulting in 10 articles. Of these, 2 were duplicates and were eliminated, totaling 8 articles for abstract analysis. After this analysis, 6 articles were

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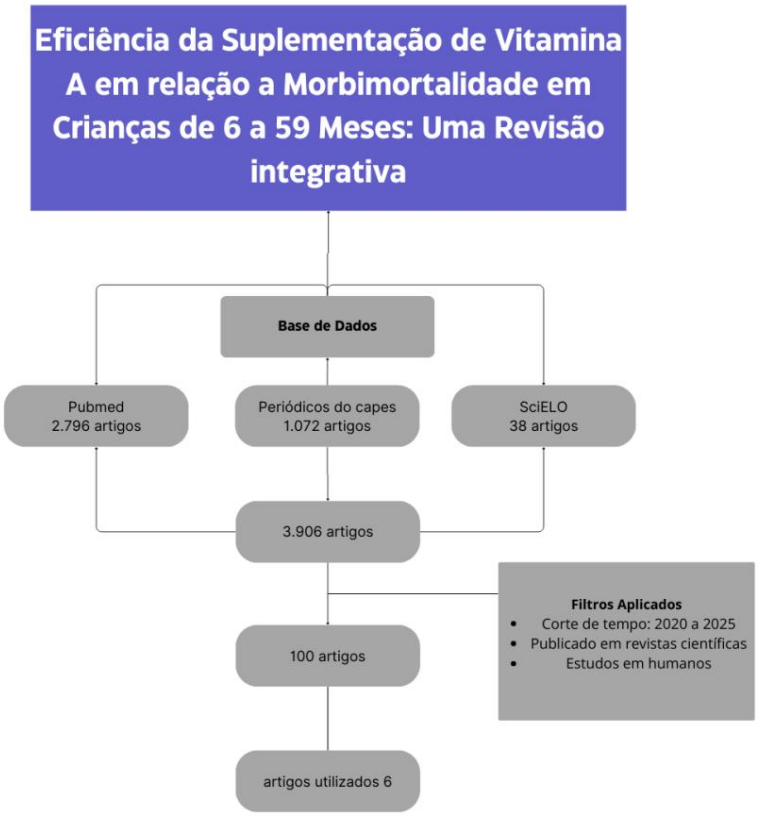
selected for inclusion in the review. The selection process was structured in an organizational gram (Figure 1), which highlights the main steps involved.

Figure 1. Flowchart of selection of articles selected for the current research.



Source: developed by the authors, 2025.

Table 1. Summary of articles analyzed for review.

In table 1, described below, the most significant results were compiled from each scientific article selected in the research, as well as authors, type of study, year of publication publication, study location, sample, objectives, methodology and results. The 08 articles are studied of those published in international journals, three of which were carried out in Brazil, two in Türkiye, two in Canada and the rest in the United Kingdom. Of the selected articles, three were published in Portuguese and five in English.

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Articles Author, year of publication, place of study	Design, type of study and N	Objectives of the study	Methodology	Main findings Reference	
1 Kassa et al., 2020, Ethiopia	Study community cross-sectional; N = 840 mothers/ caregivers of children aged 6–59 months	Assess coverage of vitamin supplementation A and associated factors among children aged 6–59 months in the district of Humbo	Home interviews with structured questionnaire; multivariate statistical analysis	Supplement coverage of 75%; associated factors include maternal knowledge of vitamin A, access to information from community health workers, and socioeconomic status	https://bmcpu-blichealth.bio-medcen-tral.com/arti-cles/10.1186/s12889-020-09617-1
2 Fisker et al., 2019, Guinea-Bissau	Unplanned study within a randomized clinical trial; N = 4,183 newborns	To evaluate the effect of high-dose vitamin A supplementation at birth on the incidence of measles in the first 12 months of life.	Observational analysis within a randomized trial; comparison between group with 50,000 IU of vitamin A and placebo group; analysis by sex and age group	Reduction in the incidence of measles in boys up to 6 months (IRR = 0.54); in girls, possible increased risk (IRR = 1.57); differentiated effect by sex	https://www.cambridge.org/core/journals/bri-tish-journal-of-nutrition/arti-cle/effect-of-highdose-vita-min-a-supple-mentation-at-birth-on-meas-les-incidence-during-the-first-12-months-of-life-in-boys-and-girls-an-un-planned-study-within-a-rando-mised-trial/78108C8E47BB709E736CB3F867B602D1
3 Castro et al., 2023, Brazil	National cross-sectional study; N = 7,716 children	to investigate factors associated with anemia and vitamin A deficiency in Brazilian children under five years of age	Data collection through national survey; statistical analysis with hierarchical model	A higher prevalence of vitamin deficiency was identified A in regions North, South and Central-West; factors such as low maternal education and the presence of more than one child in the household	https://cader-nos.ensp.fio-cruz.br/ojs/in-dex.php/csp/arti-cle/view/8366?utm_source

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					were associated with disability	
4	Barbosa, AKS; Rocha, JMH; Barreto, IC; Cardoso, KM, 2020, Maranhão, Brazil	Study transverse salt with secondary data from SUS	Assess coverage of vitamin supplementation A in children in two cities in the state of Maranhão	Data collection through interviews with guardians of children; descriptive statistical analysis	Vitamin A supplementation coverage was below the target set by the Ministry of Health; factors such as limited access to health services and lack of information were identified as barriers.	https://rsdjournal.org/index.php/rsd/article/view/7589/6722
5	Zhao, T.; Liu, S.; Zhang, R.; Zhao, Z.; Yu, H.; Pu, L.; Wang, L.; Han, L., 2022, Global Study	Ecological study using data from Global Burden of Disease (GBD) 2019; covering 204 countries and territories	Estimate incidence and disability-adjusted life years (DALYs) due to vitamin A deficiency (VAD) at global, regional and national levels from 1990 to 2019	Analysis of GBD 2019 data; calculation of estimated annual percentage change (EAPC) to assess trends in age-standardized incidence rates and DALYs; stratified analysis by sex, age and sociodemographic index (SDI)	The global age-standardized rates of incidence and DALYs of VAD decreased with EAPCs of ÿ3.11% and ÿ2.18%, respectively; regions with lower SDI had the highest incidence rates and DALYs; children under 5 years of age in low SDI regions, especially in sub-Saharan Africa, had the highest burden of VAD; men had higher rates than women; despite the overall reduction, the VAD remains a significant concern in low-income regions SDI	https://pubmed.ncbi.nlm.nih.gov/35267925/

Source: developed by the authors, 2025

Results and Discussions

According to research by Fite et al. (2020), carried out in Ethiopia, a country on the African continent, pipe, developing countries face significant difficulties in achieving broad

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coverage of vitamin A supplementation among children aged 6 to 59 months. In the district of Humbo, where the study was conducted, coverage achieved was 75%, falling short of the target nationally established rate of 80%. The authors highlight that factors such as maternal knowledge about vitamin A, access to information through community health agents and the con- socioeconomic status directly influences adherence to the supplement. Children whose mothers had a good level of knowledge (AOR 1.49), who received guidance from co-operatives community members (AOR 1.51), and who belonged to families with better economic conditions (AOR 1.80) were more likely to receive supplementation. The study reinforces the importance health education, strengthening the work of community agents and reducing social inequalities as essential strategies to increase the coverage of this intervention in vulnerable contexts. A worrying fact indicates that around 190 million children in preschool age are affected by vitamin A deficiency worldwide, with the highest prevalence rates observed in the regions of Africa and Southeast Asia, as data from the World Health Organization (WHO, 2023). When analyzing scientific articles and information collected from federal government websites, it is estimated that vitamin supplementation It can reduce infant mortality by up to 24% by combating symptoms such as diarrhea, respiratory infections and measles in children between 6 and 59 months, which are one of the main causes of infant mortality due to vitamin A deficiency, according to the study (WHO, 2021).

As pointed out by Silva et al. (2023), in a study on factors related to vitamin A deficiency in Brazilian children aged 6 to 59 months, a higher incidence was found of the shortage in the North and Northeast regions, areas marked by low socioeconomic indicators. monkeys. The study also identified a correlation with low maternal education and with qua- child malnutrition. In this scenario, strategies such as vitamin supplementation mine A have been adopted to prevent and treat this nutritional deficiency, aiming at improving of children's health status. An improvement in nutritional and immunological status was observed in supplemented children. Ramadhan et al. (2023) observed that supplementation contributed to reduce child hospitalizations and cases of infections. However, the authors also emphasize the need for caution regarding the dosage administered, due to the risk of adverse effects associated with hypervitaminosis A. According to McEldrew, Lopez and Milstein (2022), Adverse effects of vitamin A poisoning may include nausea, dizziness, vomiting, headache, irritability, blurred vision and impaired motor coordination. Hypervitaminosis nose A, a toxic form of vitamin A, can compromise several systems in the body, causing causing significant damage to the liver, bones, central nervous system and skin.

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laboratory and clinical changes vary according to the severity and duration of exposure to toxicity. city. In the liver, hepatic steatosis, hepatocellular lesions and fibrosis can be observed with accumulation of collagen; in the bones, osteoporosis and bone thickening may occur cortical; in the central nervous system, pseudotumor cerebri and cerebral edema stand out; and on the skin, manifestations such as exfoliative dermatitis and hyperplasia are common (Mceldrew; Lopez; Milstein, 2022).

As pointed out by Barbosa et al. (2020), vitamin A deficiency is associated to the increased frequency and severity of diarrhea episodes in children. In this context, supplementation of this micronutrient is considered an essential strategy for strengthening strengthening of the immune system and reducing the effects of intestinal infections. According to with the Ministry of Health (Brazil, 2023), vitamin A deficiency compromises the inte- the epithelial barrier, a fundamental structure in protecting against the entry of pathogens and in regulation of the immune response. When this barrier is damaged, there is an increase in the per- intestinal meability, facilitating the penetration of microorganisms and toxins, which can de- trigger inflammatory processes and clinical manifestations such as diarrhea (Vieira et al., 2024).

As pointed out by Fisker et al. (2019) concluded that high-dose supplementation dose of vitamin A at birth may influence the incidence of measles in the first months of life life, presenting different effects between sexes. The study showed that boys who received supplementation had a lower risk of contracting measles up to six months, while among girls a possible increase in the incidence of the disease was observed. These findings reinforce the complexity of the immune response to supplementation and the need to consider factors as biological sex in the formulation of public health policies. During blood infections, ramp in children, the risk of worsening vitamin A deficiency is significantly high, because the virus affects the integrity of the intestinal epithelium, which is responsible for the absorption sorption of various nutrients including vitamin A, with the damaged epithelium the absorption of vitamin A is impaired (SILVA; SILVA; MEIRELES, 2020). Measles significantly compromises significantly the immune system, increasing susceptibility to severe complications, such as xerophthalmia, blindness and, in more serious cases, death. In this context, the World Health Organization Health Diary (WHO et al;2025) recommends immediate vitamin A supplementation in children children affected by the disease, even if they do not show clinical signs of hypovitaminosis, due to its effectiveness in reducing morbidity and mortality. Scientific evidence shows that This supplementation helps to prevent secondary infections and reduce the severity of cases. In Brazil, the measles outbreak in 2019, with more than 28 thousand notifications, highlighted the

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urgency of implementing this measure, especially in regions with high vulnerability
social and nutritional (SILVA; SILVA; MEIRELES, 2020).

According to the study by Liu et al. (2022), published in the *International Journal of Environmental Research and Public Health,* vitamin A deficiency is strongly associated associated with night blindness, a condition that can progress to xerophthalmia and, in more severe cases, result in irreversible blindness. The article highlights that this disability disproportionately affects preschool children, especially in regions with low socioeconomic indices.
nomic, where access to supplementation and adequate nutrition is limited. Night blindness is one of the earliest and most striking pathologies of vitamin A deficiency (VAD), affecting especially preschool children in regions of greater socioeconomic vulnerability.
mica (World Health Organization, 2023). Vitamin A is essential for the formation of rhodo-
sina, a pigment present in the rods of the retina, responsible for visual adaptation in environments with little light (Tanumihardjo et al;2016). In the absence of adequate levels of this vitamin, mine, rhodopsin synthesis is compromised, resulting in difficulty seeing in the dark, condition known as night blindness. If left untreated, this deficiency can progress to more severe forms of xerophthalmia, including the formation of Bitot's spots, ulceration of the cornea and, in extreme cases, irreversible blindness (Bhutta et al;2023). Supplementation programs treatment with megadoses of vitamin A have demonstrated significant efficacy in reversing qua-
early signs of night blindness and in the prevention of more serious ophthalmic complications (Imdad et al;2022). However, the reduction in coverage of these interventions in priority countries rivers poses a real threat to the increasing prevalence of nutritional blindness, especially in regions such as sub-Saharan Africa and South Asia, where vitamin deficiency
(DVA) can affect more than 40% of children (Zhao et al., 2022). Given this scenario, complementary strategies, such as promoting the production and consumption of foods rich in vitamin A — including orange-colored vegetables, dark green leafy vegetables, and foods with animal origin — are essential to ensure adequate levels of the nutrient in a sustainable manner.
table (Parmar et al., 2021). Thus, intensifying DVA prevention actions, focusing on eye health, should be a priority in public policies aimed at children.

Barbosa et al. (2020) point out that vitamin A supplementation is an effective measure public health, especially in regions with unfavorable social conditions. They emphasize say that the correct implementation of this strategy is essential to prevent nu-
tritional diseases and infections in children, reinforcing the crucial role of the National Supplement Program Vitamin A supplementation in promoting children's health.

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According to the World Health Organization (WHO, 2011), infants between 6 and 11 months should receive a single oral dose of 100,000 IU of vitamin A (30 mg of retinol). To create For children aged 12 to 59 months, the recommendation is to administer 200,000 IU (60 mg of retinol) every four to six months, even in the presence of HIV infection. Johnson et al. (1992) indicate that this supplementation should be carried out with oily preparations, using palmitate or retinol acetate, to ensure greater absorption.

This intervention is indicated in places where the incidence of night blindness in children from 24 to 59 months is 1% or more, or when vitamin A deficiency reaches at least 20% of children between 6 and 59 months (WHO, 2011). Although, in general, supplementation is safe, mild and transient adverse effects may occur in the first 48 hours, such as nausea. nausea, vomiting, headache and bulging fontanelle in infants. However, the benefits these risks, especially in vulnerable populations.

Therefore, the WHO recommends that vitamin A supplementation be part of a integrated set of public health actions, such as vaccination campaigns, parasite control, coughs and food fortification, aiming to strengthen child survival in regions with high nutritional vulnerability.

Conclusion

The present integrative review demonstrated that vitamin A supplementation is a effective and proven strategy for reducing infant morbidity and mortality, especially among children aged 6 to 59 months in contexts of high socioeconomic and nutritional vulnerability. The studies analyzed confirm the association between vitamin A deficiency and increased infectious diseases such as diarrhea, measles and ophthalmological complications such as blindness night.

Periodic supplementation has been shown to be effective in improving immune status and nutritional, in addition to contributing directly to the reduction of infant mortality. However, therefore, the risks associated with hypervitaminosis A highlight the need for strict control of the doses administered, as well as monitoring by qualified health professionals.
of the.

Additionally, it is observed that the drop in coverage of supplementation programs in some countries and regions may jeopardize the progress already achieved, making it urgent to expansion of public health actions. In this sense, it is recommended to strengthen public health policies. practices aimed at vitamin A supplementation, encouraging the consumption of foods rich in this

micronutrient and integration with educational and nutritional measures. Such actions are fundamental such as to ensure a lasting and sustainable impact in promoting child health.

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