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Nutritional Supplementation for Pregnant Women to Prevent Stunting Among Children: A Scoping Review

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Stunting can interfere with the growth and development of children because it's a chronic nutritional problem caused by a deficit in nutritional intake for a long period of time. If during pregnancy the mother's nutritional status is low, there is a risk of giving birth to a stunting baby. Supplements are given to meet the nutritional needs of pregnant women who are not fulfilled from food. Objective: This study aims to analyze the current literature on nutritional supplementation programs for pregnant women to prevent further stunting among children. Methods: This literature review was carried out on articles in PubMed and CINAHL, published from 2012 to 2022, with a systematic review, meta-analysis, as well as clinical and RCT designs in English. The primary keyword used were "supplements" AND "pregnancy" OR "antenatal" AND "stunting" AND "prevention". Results: Only 9 articles aligned with the criteria were reported, some of which stated that lipid-based nutritional supplements reduced the risk of stunting babies. Furthermore, supplements containing folic acid, iron, micronutrients, zinc, osteocalcin, and animal protein can reduce the risk of stunting. Conclusions: Supplements for pregnant women containing folic acid and iron, specific nutrients, lipid-based nutritional supplements, micronutrients, osteocalcin, and animal protein reduce stunting in children.

Kata kunci:

Nutrisi
Kehamilan
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A B S T R A K

Stunting dapat mengganggu pertumbuhan dan perkembangan anak karena merupakan masalah gizi kronis yang disebabkan oleh kekurangan asupan gizi dalam jangka waktu yang lama. Jika selama hamil status gizi ibu rendah maka berisiko melahirkan bayi stunting. Suplemen diberikan untuk memenuhi kebutuhan gizi ibu hamil yang tidak tercukupi dari makanan. Penelitian ini bertujuan untuk menganalisis literatur terkini tentang program suplementasi gizi bagi ibu hamil untuk mencegah stunting lebih lanjut pada anak. Tinjauan literatur ini dilakukan pada artikel di PubMed dan CINAHL, diterbitkan dari tahun 2012 hingga 2022, dengan tinjauan sistematis, meta-analisis, serta desain klinis dan RCT dalam bahasa Inggris. Kata kunci utama yang digunakan adalah "suplemen" DAN "kehamilan" ATAU "antenatal" DAN "stunting" DAN "pencegahan". Hasil: Hanya 9 artikel yang sesuai dengan kriteria yang dilaporkan, beberapa di antaranya menyatakan bahwa suplemen nutrisi berbasis lipid menurunkan risiko bayi stunting. Selain itu, suplemen yang mengandung asam folat, zat besi, mikronutrien, seng, osteokalsin, dan protein hewani dapat menurunkan risiko stunting. Kesimpulan: Suplemen ibu hamil yang mengandung asam folat dan zat besi, nutrisi spesifik, suplemen nutrisi berbasis lipid, mikronutrien, osteokalsin, dan protein hewani menurunkan stunting pada anak.

INTRODUCTION

Stunting can interfere with the growth and development of children because it is a chronic nutritional problem caused by a deficit in intake for an extended period. In 2021, UNICEF reported that more than 149 million children under 5 were stunted. Asia has a prevalence of 21.8% or around 79 million children. Meanwhile, Southeast Asia has a prevalence of 27.4% or approximately 15.3 million children(UNICEF, WHO, 2021). The Indonesian Nutritional Status Study (SSGI) found that the national stunting rate decreased by 1.6%, from 27.7% in 2019 to 24.4% in 2021. The majority of the 34 provinces in Indonesia exhibited a reduction compared to 2019, with only five provinces showing an increase. Therefore, the implementation of government policies to accelerate stunting reduction shows good results. However, this figure is still below the prevalence rate targeted in the RPJNM or the Medium-Term Development Plan in 2024, which is 14%(Biro Komunikasi dan Pelayanan Masyarakat Kementerian Kesehatan RI., 2022). In Indonesia, the prevalence of pregnant women who experience CED and anemia is 17.3% and 37.1%, respectively(Badan Penelitian dan Pengembangan Kesehatan Kemenkes RI, 2018).

The government is also trying to prevent stunting by launching the First 1000 Days of Life program. The program begins from the time of pregnancy for 270 days until the child is 2 years or 730 days. The 1000 days are potentially extraordinary and have significant vulnerabilities. The good or bad condition of the mother during pregnancy and the child being cared for will greatly determine the ability to grow and develop.

One of the specific efforts to prevent stunting is the First 1000 Days of Life, consisting of Early Breastfeeding Initiation, exclusive breastfeeding, complementary feeding, pregnancy checks such as antenatal care (ANC), administration of Fe tablets to pregnant women, administration of Vitamin A body weight, primary immunization, supplementary feeding, and growth monitoring(Lutter et al., 2013). About 27.95% of pregnant women received at least 90 Fe tablets. Improving the growth of fetal cells in the womb necessitates the presence of nutrients. Since dietary nutrients are insufficient to meet requirements, supplements are necessary. Studies showed that supplements such as Fe tablets during pregnancy can increase hemoglobin(Ratih, 2017). In addition, supplementation can reduce low birth weight (LBW), leading to stunting(Nopitasari & Maghfiroh, 2018).

METHODS

This literature study was made by conducting a comprehensive review and analyzing scientific articles. The review included a meta-analysis and clinical and a randomized control trial in English published from 2012 to 2022. The literature was obtained by searching several databases, namely CINAHL and PubMed. In addition, the search was conducted using the keywords supplement, pregnancy, stunting, prevention, and other words with similar meanings.

In this study, the search strategies are supplements, dietary supplements, nutrition, pregnancy, pregnancy, pregnant women, perinatal, antenatal, stunting, stunted, and prevention. Furthermore, the most effective terms that helped identify related articles included "pregnancy supplements and stunting prevention supplements. These terms were used to search for related studies in CINAHL and PubMed.

Table 1. Search strategy in PubMed database for study selection

Search	Term	Results
	PUBMED	
#1	"dietary supplements"[MeSH Terms] OR ("dietary"[All Fields] AND "supplements"[All Fields]) OR "dietary supplements"[All Fields] OR "supplement"[All Fields] OR "supplemented"[All Fields] OR "supplementing"[All Fields] OR "supplementations"[All Fields] OR "supplemention"[All Fields]) OR ("dietary supplements"[MeSH Terms] OR ("dietary"[All Fields] AND "supplements"[All Fields]) OR "dietary supplements"[All Fields]) OR ("nutrition s"[All Fields]	12,781
#2	"pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields] OR ("gravidity"[MeSH Terms] OR "gravidity"[All Fields] OR "pregnant"[All Fields] OR "pregnants"[All Fields]) OR ("pregnant women"[MeSH Terms] OR ("pregnant"[All Fields] AND "women"[All Fields]) OR "pregnant women"[All Fields]) OR ("perinatal"[All Fields] OR "perinatally"[All Fields] OR "perinatals"[All Fields]) OR ("antenatal"[All Fields] OR "antenatally"[All Fields])	12,808
#3	("growth disorders"[MeSH Terms] OR ("growth"[All Fields] AND "disorders"[All Fields]) OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields] OR ("growth disorders"[MeSH Terms] OR ("growth"[All Fields] AND "disorders"[All Fields]) OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields]) OR (("growth disorders"[MeSH Terms] OR ("growth"[All Fields] AND "disorders"[All Fields]) OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields]	1,316
#4	"prevent"[All Fields] OR "preventability"[All Fields] OR "preventable"[All Fields] OR "preventative"[All Fields] OR "preventatively"[All Fields] OR "preventatives"[All Fields] OR "prevented"[All Fields] OR "preventing"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields] OR "prevention s"[All Fields] OR "preventions"[All Fields] OR "preventive"[All Fields] OR "preventively"[All Fields] OR "preventives"[All Fields] OR "prevents"[All Fields	58,213
#5	#1 AND #2 AND #3 AND #4	22

Table 2 – Search strategy in CINAHL database for study selection

CINAHL Plus with Full Text via EBSCOhost		
Expanders - Apply related words; Also search within the full text of the articles; Apply equivalent subjects		
Search modes - Boolean/Phrase		
#1	TX (supplements OR supplementation OR dietary supplements OR nutrition)	254
#2	TX (pregnancy OR pregnant OR pregnant women OR perinatal OR antenatal OR maternal)	341
#3	TX (stunting OR growth disorder OR stunted)	139
#4	TX (prevent or prevention or preventing or stunting prevention)	245
#5	#1 AND #2 AND #3 AND #4	26
#6	**Limiters** - Full Text; Language: English; Published Date: 20120401-20220431	24

The titles and abstracts were filtered and searched for relevance. The filters used are articles with Abstract, Free full text, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, and Systematic Review over 10 years.

his study extracted data from the articles based on the data extraction form and issues. All data were extracted using a checklist consisting of the author's name, title, year published, language, methods, objectives, and results.

The first author reviewed the title and abstract independently, and irrelevant articles were excluded from the review. Articles deemed relevant were viewed in full text and graded in detail based on inclusion criteria. The reasons for excluding full-text papers that do not meet the inclusion criteria are recorded in the PRISMA 2020 flowchart. Through conversation with the second and third authors, all disagreements in the stages of the selection process are resolved.

According to the review, full-text articles were extracted using the JBI data extraction instrument. The data reviewed are the characteristics of the article, population, study objectives, and results. The population is the main criterion for the sample, and this study aims to determine the effect of pregnant women supplements in the prevention of stunting.

A narrative approach was used to synthesize the study findings, which were then discussed and summarized. The analysis results included the significance value, and related problems in the data extraction process are resolved through discussion with the second and third authors. The extracted data is tabular to provide a descriptive summary of the reviewed articles.

RESULTS AND DISCUSSION

Figure 1 shows the search results of 142 documents obtained using the search strategy in the research database (PubMed 18 and CINAHL 24), but the number of articles after the duplication check was 134.

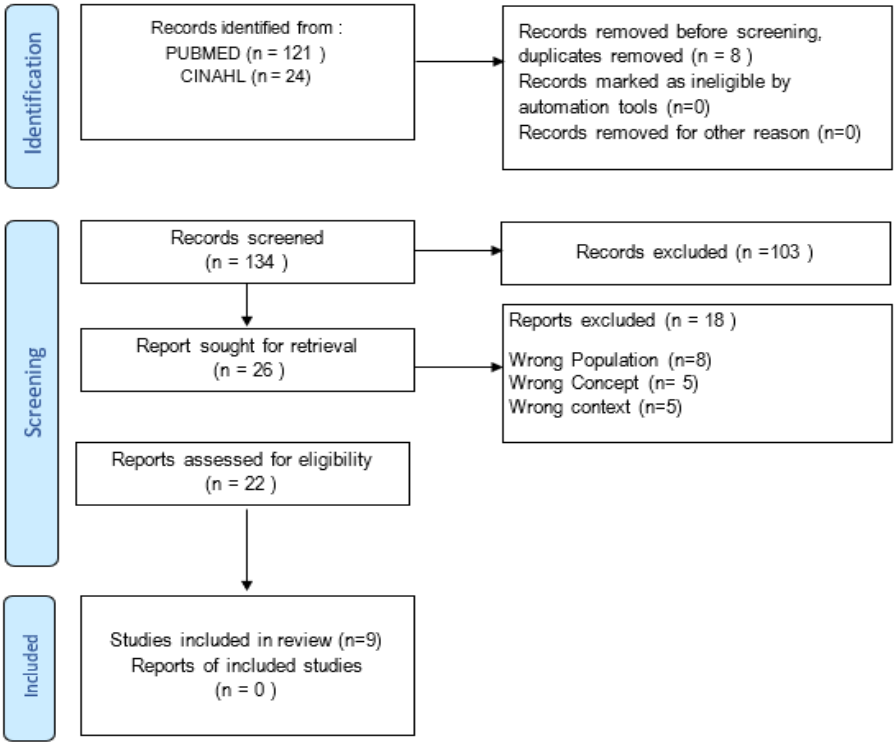

Figure 1: PRISMA flow diagram for article selection (PRISMA 2020)

In a previous related study using data extraction tables, we individually mapped data on articles published by all authors, year of publication, title, language, methodology, objectives, and significant findings.

Table 3 – Synthesis of the studies selected for the scope review

Authors (years)	Country/ Region	Design	Population	Objective Study	Findings
Nisar et al (2016) (Nisar et al., 2016)	Nepal	*Retrospective Cohort Study*	We used the data on women's most recent live births within 2 years prior to the date of interview from three Nepal Demographic and Health Surveys (NDHS) 2001 [10], 2006 [14], and 2011 [5]. The de-identified data are available in the public domain from the DHS Measure website	The aim of this study was to determine the effect of antenatal iron folic acid (IFA) supplementation on stunting in Nepalese children aged <2 years.	The results showed that the use of antenatal IFA supplements significantly reduced the risk of stunting and severe stunting in children aged < 2 years in Nepal.
Nisar et al (2020) (Nisar et al., 2020)	South Asian	*Pooled Analysis*	The sample was 96,512 mothers with their most recent birth within two years, from nationally representative surveys between 2005 and 2016 in seven South Asian countries. Primary outcomes were stunting [length-for-age Z-score (LAZ) < −2], severe stunting [length-for-age Z-score (LAZ) < −3], length-for-age Z score, and perceived smaller than average birth size. Exposure was the use of IFA supplements.	This study aimed to investigate the association between antenatal IFA supplementation and stunting, severe stunting, length for age-Z score, and birth size in South Asian children aged < 2 years.	Results from the study found that antenatal IFA use was significantly associated with a significantly reduced risk of smaller-than-average, stunted, and severely stunted birth size in South Asian children <2 years of age.
Sukmawati et al (2021)(Sukmawati et al., 2021)	Indonesia	*Literature Review*	Article using randomized controlled trials, retrospective, cross-sectional and quasi-experimental cohort studies, (2) evaluating the results of education for pregnant women to prevent stunting, and (3) evaluating nutrition for pregnant women to prevent stunting.	This article aims to identify several studies on the effects of stunting prevention and education, as well as nutrition on pregnant women	The results of this article review identify that the educational media used, namely through demonstrations and direct practice to prevent stunting in pregnant women, is useful for increasing the knowledge of pregnant women. As well as the practice of feeding, meal preparation, amount of food consumed, energy intake, and protein intake as an effort to prevent stunting.
Lassi et al (2021) (Lassi et al., 2021)	Africa & Asia	*Systematic review*	Randomized control trials, and quasi experimental trials to evaluate the impact of nutritional interventions (BEP, FDP, and dietary interventions to prevent maternal obesity) compared to control or standard of care, among healthy pregnant women of any age living in LMICs.	This study aims to summarize 15 studies on the effects of maternal nutrition interventions on maternal and infant health.	The results of this literature review indicate that BEP supplementation is effective in increasing birth rates, perinatal mortality, LBW, SGA, and birth weight. BEP supplements when consumed by pregnant women showed a significant increase in birth weight. In addition, FDP also has many benefits for long-term anthropometric results and stillbirth mortality.
Rohmawati et al (2021) (Rohmawati et al., 2021)	Indonesia	RCT	A total of 71 pregnant mothers and their newborns completed this study. They were divided into two groups of 35 and 36	To investigate the influence of zinc supplementation on pre- gnant women for the prevention of	The mean maternal serum zinc level was 54.6±8.7 µg/dL from 71 patients. The mean maternal serum zinc levels after zinc supplementation were significantly higher than

Authors (years)	Country/ Region	Design	Population	Objective Study	Findings
			patients, the supplementation (20 mg/day) and pla- cebo groups, respectively for 12 weeks.	stunting through an analysis of maternal serum zinc, cord blood osteocalcin and neonatal birth length.	those of the place- bo group: 55.1±9.9 to 59.1±8.6) μg/dL (p=0.017) and 54.2±7.5 to 50±8.6 μg/dL (p=0.001), respectively. Maternal serum zinc levels after zinc supplementation had a positive significant correlation with cord blood osteocalcin and neonatal birth length: r=0.434 (p=0.001) and r=0.597 (p=0.001), respectively. There was a significant correlation of maternal serum zinc with cord blood osteocalcin and neonatal birth length after zinc supplementation
Goto (2019)(Goto, 2019)	Japan	Meta-analysis	Randomized control trials involving pregnant women to provide the primary outcomes mentioned as follows between lipid-based nutrients and other supplements, including IFA, UNIMAP, other MMN, and CSB.	To examine whether prenatal lipid-based nutrient supplementation is an effective means of improving birth outcomes compared with other types of supplementation including iron folic acid (IFA), United Nations multiple micronutrient preparation (UNIMAP), other multiple micronutrients (MMN), and fortified corn–soy blend (CSB).	Lipid-based nutrient supplementation significantly reduced the risks of low birthweight, small for gestational age, and stunting (***n*** = 5, 5, and 4, respectively) and significantly increased the means of birthweight, birth length, arm circumference, and weight-for- age ***z***-score (***n*** = 5, 5, 4, and 3, respectively). In conclusion, the results supported the efficacy of prenatal lipid-based nutrient supplementation compared with IFA, UNIMAP, other MMN, and CSB for reducing the risk of small birth size.
Pimpin et al (2019)(Pimpin et al., 2019)	USA	systematic review and meta-analysis of randomized trials	all randomized control trials that evaluated the effect of animal-source food intake in pregnancy, lactation, or children ≤age 5 y, including premature infants, low-birth-weight infants, and stunted or otherwise malnourished children, on growth outcomes as described above, including an effect measure and information to compute its standard error.	The aim of this study was to investigate effects of animal protein supplementation in mothers, preterm infants, and term infants/children on birth and growth outcomes.	Maternal supplementation increased birth weight by 0.06 kg, and both formula and food-based supplementation in term infants/young children increased weight by ≤0.14 kg. Neither formula nor food-based supplementation for term infants/young children increased height, whereas the height-for-age *z*-score was increased in the food-based (+0.06 *z*-score) but not formula-based (−0.11 *z*-score) trials reporting this outcome. In term infants, the weight-for-length *z*-score was increased in trials of formula (+0.24 *z*-score) and food supplementation (+0.06 *z*-score), whereas food supplementation was also associated with reduced odds of stunting (−13%).
Dewey et al (2020)(Dewey et al., 2020)	Bangladesh	cluster-randomized effectiveness trial with four arms	4011 women at <20 weeks gestation; 1552 were adolescents.	examined the effects of the Rang Din Nutrition Study (RDNS)	Among adolescents, prenatal LNS reduced newborn stunting by 25% and small head size by 28% and had a

Authors (years)	Country/ Region	Design	Population	Objective Study	Findings
				interventions on children born to mothers <20 years of age.	marginally significant effect on newborn wasting, compared with IFA. Low birth weight and preterm birth were reduced only among adolescents with lower food security. Effects on subsequent growth status were observed only among female children in the LNS-LNS group: less stunting at 18 months (versus IFA-MNP) and lower prevalence of small head circumference and wasting at 24 months (versus IFA-Control).
Terstappen (2020) (Terstappen et al., 2020)	Netherlands	Systematic Review and Meta-Analysis	animal and human studies reporting on prenatal supplementation of 14 AAs falling within the following three groups: (1) arginine family: arginine, citrulline, glutamate, glutamine, asparagine, aspartate, proline, and ornithine; (2) BCAA: leucine, iso-leucine, and valine; and (3) methyl donors: cysteine, methionine, and the AA derivate choline. Search strings are provided	to assess whether prenatal amino acid (AA) supplementation could be a promising approach to promote healthy fetal growth.	meta-analysis showed beneficial effects of arginine and (N-Carbamyl) glutamate (NCG) but not aspartic acid and citrulline on fetal/birth weight. However, no effects were reported when an isonitrogenous control diet was included. B CAA and methyl donor supplementation did not affect fetal/birth weight. Arginine family supplementation, in particular arginine and NCG, improves fetal growth in complicated pregnancies.

In this literature study, 9 articles were found that matched the research criteria. The results of the search for articles found 4 articles stating that lipid-based nutritional supplements were significant enough to reduce the risk of small birth size babies, especially those who were at higher risk of fetal growth restriction. Another article using supplements containing folic acid, iron, micronutrients, zinc, osteocalcin, and animal protein supplements also stated that they could reduce the risk of stunting in children.

Table 4 - Summary of the content of the supplements used

No	Title	The content of the supplements
1.	Iron-Folic Acid Suplementation During Pregnancy Reduces the Risk of Stunting in Children Less Than 2 Years of Age : A Retrospective Cohort Study from Nepal (Nisar et al., 2016)	Iron-Folic Acid
2.	Antenatal Iron-Folic Acid Supplementation Is Associated with Improved Linear Growth and Reduced Risk of Stunting or Severe Stunting in South Asian Children Less than Two Years of Age : A Pooled Analysis from Seven Countries (Nisar et al., 2020)	Iron-Folic Acid
3.	Stunting Prevention with Education and Nutrition in Pregnant Women: A Review of Literature (Sukmawati et al., 2021)	beta carotene, thiamin (B1), riboflavin (B2), niacin (B3), calcium, iron, phosphorus, magnesium, zinc, and Vitamin C
4.	Effects of nutritional interventions during pregnancy on birth, child health and development outcomes: A systematic review of evidence from low- and middle-income countries (Lassi et al., 2021)	BEP Supplementation: protein <25% total content. Macronutrients (carbohydrates, protein, fat). Micronutrients (Calcium, folic acid, iron, magnesium, phosphorus, Vitamin A, Vitamin B6, Vitamin C, D, and Zinc)
5	A randomized, placebo-controlled trial of zinc supplementation during pregnancy for the prevention of stunting: analysis of maternal serum zinc, cord blood osteocalcin and neonatal birth length (Rohmawati et al., 2021)	1. Zinc
6	Effectiveness of prenatal lipid-based nutrient supplementation to improve birth outcomes: a meta-analysis (Goto, 2019)	Lipid-based nutrition and other supplements, including
7	Effects of animal protein supplementation of mothers, preterm infants, and term infants on growth outcomes in childhood: a systematic review and	2. Animal protein

No	Title	The content of the supplements
	meta-analysis of randomized trials (Pimpin et al., 2019)	
8	Nutrient supplementation during the first 1000 days and growth of infants born to pregnant adolescents (Dewey et al., 2020)	3. Iron-Folic Acid, lipid-based nutrient, micronutrient
9	Prenatal Amino Acid Supplementation to Improve Fetal Growth: A Systematic Review and Meta-Analysis (Terstappen et al., 2020)	4. Amino Acid

Stunting is a nutritional problem in children who has the potential to have many negative impacts. It causes disturbances to children's growth and development and reduces their quality of life(Dewey et al., 2020). Furthermore, it reaches 36%, far above the WHO standard of 20% in Asia, and prevention should be a priority in addition to handling. Prevention has been carried out since pregnancy by giving supplements to pregnant women. The supplements include iron, folate origin, micronutrients, vitamin D, and other nutrients.

Iron deficiency negatively affects pregnancy, immune function, and neurodevelopment in children(Georgieff et al., 2019). The risk of postnatal iron deficiency in infants is reduced when neonatal iron levels are normal after pregnancy, cord clamping is delayed, and postnatal growth rates are not excessive(Dewey & Oaks, 2017).

A short-term study to assess the acceptability of small quantity-lipid based nutrients supplements (SQ-LNS) was conducted among children aged 6-12 months and their caregivers in South Africa(Hess et al., 2011), infants and pregnant or lactating women in Ghana, considered effective in reducing stunting(Adu-Afarwuah et al., 2016).

Multi-micronutrient deficiency (MMN) is common in women of reproductive age in developing countries. Aggravated by the demands of pregnancy, it causes potentially detrimental effects on the mother and developing fetus. Supplementation containing MMN resulted in a significant reduction in the number of newborns identified as low birth weight (LBW) (mean risk ratio (RR) 0.88, 95% confidence interval (CI) 0.85 to 0. 91; high-quality evidence) or small gestational age (SGA) (mean RR 0.92, 95% CI 0.86 to 0.98; moderate-quality evidence)(Keats et al., 2019).

Vitamin D deficiency in pregnancy is associated with a wide range of clinical outcomes, including obstetric complications, preterm birth and adverse hereditary effects affecting the skeletal, immune and respiratory systems[21-22]. The UK Department of Health recommends routine antenatal vitamin D supplementation with 400 IU of cholecalciferol daily during pregnancy, regardless of ethnicity and other risk factors for Vitamin D deficiency(Hughes et al., 2008). Studies showed that supplementation is essential in reducing the risk of neonatal hypocalcemia and improving neonates' 25(OH)D status(Pérez-López et al., 2015).

Poor maternal zinc status is associated with fetal loss, congenital malformations, intra-uterine growth retardation, decreased birth weight, prolonged labour and preterm or post-term delivery(Chaffee & King, 2012). The estimated prevalence of insufficient zinc intake correlated with the prevalence of stunting (low height for age) in children under five years ($r = 0.48$, $P < 0.001$), although there is considerable variability about the most suitable line. Furthermore, 84 out of 141 (59.6%) low- and middle-income countries had stunting prevalence >20%. Using a composite index of both indicators (estimated prevalence of inadequate zinc intake >25% and prevalence of stunting >20%), 32 of these countries were identified as at high risk of inadequate zinc intake(Wessells & Brown, 2012). Therefore, zinc supplements also needed by pregnant women to prevent stunting.

Based on a review of articles, taking supplements, IFA, and FDP was proven to reduce stunting, LBW, and consumption of nutrient-rich foods such as Moringa leaves which contain beta-carotene, B1, B2, B3, calcium, iron, phosphorus, magnesium, zinc. Vitamin C as an alternative to improve the nutritional status of pregnant women has also been shown to be beneficial for the fulfilment of nutrition and can reduce stunting.

Nutritional problems in pregnancy can be overcome with several interventions. In this study, there were 4 types of interventions, namely supplementary feeding (PMT), nutritional supplements, counseling or nutrition education and combinations. The four interventions affect pregnant women and their children(Suntari et al., 2020). The implementation of nursing that can be done is education about nutrition during antenatal care can be conducted at health centers or clinics that teach pregnant women the importance of stunting prevention and IFA supplements. Nutrition education through classes is also effective in increasing the knowledge and attitudes of pregnant women in preventing stunting(Ekayanthi & Suryani, 2019).

In addition to education, it is also necessary to carry out nutritional counseling for pregnant women. Counseling is needed during pregnancy and useful for providing nutrition to children. Mothers are the primary caregivers of children, and maternal nutrition counseling can effectively improve children feeding knowledge and practices. Optimal children feeding practices were also more common among mothers from intervention areas compared to control areas (exclusive breastfeeding: 72.7 vs 59.4%, $P = 0.008$; feeding 4+ food groups: 42.9 vs 34.1 %, $P<0.001$; had minimum acceptable diet: 31.2 vs 25.3%, $P= 0.017$; fed some micronutrient powder: 16.2 vs 7.4%, $P <0.001$)(Mistry et al., 2019).

The provision of supplements such as IFA is one of the interventions to prevent stunting in pregnant women. Prevention of stunting by giving supplements can be applied to nursing practice. Supplementation is considered significant in reducing the risk of stunting.

The results are based on study and analysis from various studies that completed supplementation and nutrition therapy to reduce the risk of stunting. Providing complete supplements and nutrition is one of the interventions in the 1000 HPK program. Supplementation in nursing practice can be conducted at the promotive and preventive stages. Improving maternal nutritional status and appropriate infant feeding during the critical first 1000 days can reduce morbidity and mortality, with important benefits on children growth and development(World Health Organization, 2003).

LIMITATION OF THE STUDY

The titles and abstracts of the articles searched for relevance to this study were filtered to obtain the released content. The search period lasted from March 10, 2022, to April 1, 2022, and this study was limited to English-language articles published between January 2012 and March 2022.

CONCLUSIONS AND SUGGESTIONS

Nutritional supplements for pregnant women containing folic acid and iron, specific nutrients, lipid-based nutrition, micronutrients, osteocalcin, and animal protein reduce stunting in children. Meanwhile, continuous monitoring is necessary to prevent stunting in children.

The results of this study can contribute to nursing practice, especially in prenatal care which aims to prevent stunting. Nursing practice can be carried out at the promotive and preventive stages by providing nutritional supplements to improve the nutritional status of the mother accompanied by proper feeding of infants and children for the first 1000 days. In addition, it is expected to result in a reduction in morbidity and mortality, as well as more optimal growth and development of children.

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Conflict of Interest Statement

The author has no conflict of interest in the review

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