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The Effect of Pumpkin Seed Biscuits and Moringa Capsules on (Malondialdehyde) Levels and Birth Outcomes of Pregnant Women

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Abstract

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BACKGROUND: Maternal and infant mortality is a global health problem, the direct cause of which is malnutrition. Dietary supplements and vegetables are mandatory to support the nutritional needs of pregnant women. *Moringa oleifera* and pumpkin seeds contain nutrients, and the price is relatively cheap; therefore, they are very good for consumption by pregnant women. The aim of the study was to find literature on the effect of pumpkin seed biscuits and moringa capsules on the effects of malondialdehyde (MDA) levels and birth outcomes of pregnant women.

AIM: The objective of the study was to review journals related to the effect of pumpkin seed biscuits and moringa capsules on (MDA) levels and birth outcomes of pregnant women.

METHODS: Study literature by collecting relevant journal data based on PubMed, ScienceDirect, and ProQuest.

RESULTS: supplementary food that is cheap and easily available to pregnant women by giving pumpkin seeds and moringa leaf extract has an impact on improving nutritional status and preventing such as low birth weight (LBW). Moreover, the result found that food ingredients from pumpkin seeds and moringa have high nutritional value and are very beneficial for pregnant and lactating women.

CONCLUSION: The screened articles with inclusion and exclusion criteria support and recommend additional nutrients such as *Moringa oleifera* and pumpkin seeds to pregnant women. These two foods directly contribute to the prevention of MDA which causes stress, preeclampsia, LBW babies, severe anemia, babies growth and development, as well as maternal and babies mortality.

Introduction

The phenomenon of the high maternal mortality rate (MMR) reflects inequality in access to health services. In 2007, the (MMR) in low-income and developed countries was 462/100,000 births and 11/100,000 births [1]. Furthermore, there are other causes of malnutrition such as the triggering factors for MMR, in South Asia and sub-Saharan Africa. In 2011, there were 165 million children who grew up stunted due to iodine and iron deficiency, and it caused developmental disorders in children [2]. In Indonesia, the problem of nutrition for pregnant women and their children has received government intervention following the regulation of the Minister of Health Number 23 of 2014 concerning efforts to improve nutrition [3]. In addition, socialization is so important to increase citizens' awareness [4]. The aim of the study was to review journals related to the effect of pumpkin seed biscuits and moringa capsules on malondialdehyde (MDA) levels and the birth outcomes of pregnant women.

Malnutrition in pregnant and lactating women is not a problem; malnutrition can cause premature babies, low birth weight (LBW) babies, and even cause postpartum, besides severe anemia during pregnancy causes an increased risk of maternal death [5], and strengthens the occurrence of premature birth [6].

LBW is closely related to maternal malnutrition [7], and inadequate food intake in pregnant women. The suggestion to consume highly nutritious foods, vegetables, and other complementary supplements is very useful, such as the consumption of moringa vegetables. A study conducted in Tanzania found that pregnant women who consumed probiotic yogurt and *Moringa oleifera* can increase the relative abundance of *Bifidobacterium* [8]. Other studies confirmed that *Moringa oleifera* extract could control hemoglobin which is the main trigger of anemia in pregnant women, and they need at least 120 mg of iron every day [9]. Hemoglobin levels at reproductive age can be increased with *Moringa oleifera* [10] due to its similar effects of iron-folate supplementation on the incidence of LBW [11]. Furthermore, pregnant women are also very stressed due to the increased

oxidation products such as MDA. They have increased level of MDA levels compared to non-pregnant women. Elevated MDA can lead to preeclampsia, fetal growth restriction, and fetal growth barriers or intrauterine growth restriction/IUGR [12]. Preeclampsia in pregnant women is one of the main causes of death [13].

This study found that MDA in pregnant women can be overcome with pumpkin seed oil, which works by reducing lipid peroxidation and providing protection against oxidative stress [12]. Pumpkin seeds are also used as biscuits (*Cucurbita. moschata D.*) because they are practical and easy to consume. They contain pyrazolidine, amino acids, citrulline, and ethyl asparagine. The dose of content in 100 mg of pumpkin seeds contains 446 calories of energy, 19.4 grams of fat, 53.7 grams of carbohydrates, 3.2 grams of omega 3, and 18.5 grams of protein [14].

Moringa oleifera and pumpkin seeds can be used as dietary supplements to reduce MDA in pregnant women. The content in these two foods greatly provides the nutrition needed to fight diseases such as preeclampsia, LBW, anemia, and babies' growth, as well as decrease the rate of mortality.

Methods

This study is a literature review and was obtained from three databases of PubMed, ScienceDirect, and ProQuest. The search criteria in the database use the word with keywords (Pumpkin Seeds, Moringa, Pregnant Mothers Results, Malondialdehyde Levels). Inclusion Criteria (1) on articles published during the last 10 years (2010-2021), (2) English title, (3) open access, (4) full text and exclusion criteria (1) review, (2) proceedings, (3) literature review, systematic review, meta analysis. The number of articles found was 474 from the data base, then filtered using PRISMA Flow diagrams, articles that met the criteria of 5 articles for review. The following table shows the Prism Flow diagram.

The article search process is filtered based on inclusion and exclusion criteria, as shown in the PRISMA Flow Diagram:

Results

The filtering results of article search on the PubMed, ScienceDirect, and ProQuest databases are shown in Figure 1.

Adequate nutrition in pregnant women will affect the health of the fetus they contain and of course, reduce the risk of malnutrition, stunting, and various

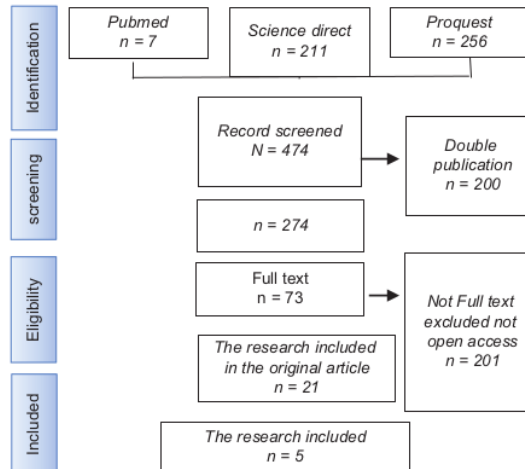


Figure 1: Flow Chart PRISM

other diseases due to malnutrition. *Moringa oleifera* extracts given to pregnant women were proven to prevent LBW in babies. This extract contains similar content as iron-folate, and it is recommended by the government as a local ingredient to replace iron-folate [11]. This study showed that *Moringa oleifera* has many benefits, specifically as an additional dietary supplement for pregnant women and preventing the risk of death. Hence, moringa capsules can be used to suppress stress so that MDA. Based on a literature search in the three databases, 5 articles were found according to the inclusion and exclusion criteria described in the PRISMA Flow Chart. Then the results of the search for articles can be seen in Table 1 below;

The next article will discuss the effects of moringa honey on additional nutrients and MDA in pregnant women and the birth of babies [15].

Another article highlighted the prevalence of malnutrition in pregnancies of 1–5 months, which were 2.4%, 3.2%, 6.5%, 7.4%, 9.7%, and 7.9%, respectively. Furthermore, it showed that *Moringa oleifera* could overcome malnutrition and prevent babies born with stunting [16].

A study conducted in Kenya recommended supplements in the form of pumpkin seeds since they are rich in fiber, oil, and protein [17]. This is because malnutrition has a negative impact on pregnant women and their unborn babies. In addition, this substance contains antioxidants including alkaloids, saponins, phytosterols, tannins, phenolics, polyphenols, and flavonoids. Polyphenol and flavonoid levels in moringa leaves are known to be higher than other leaves such as pumpkin leaves and fern leaves. In addition, moringa leaves also contain Vitamin C 220 mg/100 g leaves. The Vitamin C content of moringa leaves is almost four times more than other leaves such as kenikir leaves which contain 64.6 mg/100 g of Vitamin C, and papaya

Table 1 : Syntetis grid

Number	Author name (years)	Title study	Origin country	Results recommendation
1	Nadimin et al., 2020 [11]	A comparison between extract <i>M. oleifera</i> and iron tablet on prevention of LBW in pregnant mothers in Makassar, Indonesia	Indonesia	<i>M. oleifera</i> extract supplements have the same effect as iron-folate in preventing LBW; recommendations are needed for further study to see effects of <i>M. oleifera</i> on other pregnancy disorders
2	Muis et al., 2014	Effect of Moringa leaves extract on occupational stress and nutritional status of pregnant women informal sector workers	Indonesia	Extract of Moringa (Moringa capsules) in pregnant women informal workers can reduce stress and increase MUAC but cannot increase hemoglobin levels. Stress can increase MDA levels
3	Kanwal et al., 2015	Development, physicochemical, and sensory properties of biscuits supplemented with pumpkin seeds to combat childhood malnutrition in Pakistan	Pakistan	It was concluded that pumpkin seed biscuits can be supplemented successfully to partially replace wheat flour to prepare highly nutritious biscuits without affecting its overall acceptability
4	Iskandar et al., (2015)	Effect of <i>M. oleifera</i> leaf extracts supplementation in preventing maternal anemia and LBW	Indonesia	<i>M. oleifera</i> extract is able to retain ferritin serum level up to 50%, and birth outcomes of pregnant women and LBW was not found in pregnant women who received
5	Zakiah et al., (2020) [19]	The effect of giving the supplement of Kelor leaves (<i>M. oleifera</i> leaves) plus royal jelly to malondialdehyde levels in anemic pregnant women in Takalar District	Indonesia	MLE capsule showed significant results in reducing MDA levels, although not as good as MLERJ

leaves which contain 61.8 mg/100 mg of Vitamin C. Hence, these substances can lower blood pressure and relax blood vessels. Other studies also linked depression with poor nutrition [18], and this nutritional deficiency often occurs during pregnancy and a year after giving birth.

This study discussed the role of *Moringa oleifera* and pumpkin seeds on the health of pregnant women.

Malnutrition in pregnant women affects the development and growth of the baby. *Moringa oleifera* has many benefits for maternal health and contains various types of Vitamin A, E, C, and high [19]. A study conducted in Nigeria found that Vitamin C is very beneficial in pregnant women, specifically in suppressing lipid peroxidation which can cause premature birth and fetal growth retardation. Furthermore, consumption in pregnant women can lower blood pressure [20].

Studies in India confirmed that GPX and SOD are indeed increased compared to non-pregnant women. Therefore, additional supplements that contain lots of vitamins and antioxidants are needed to overcome stress triggers and prevent preeclampsia [21]. Malnutrition also causes stress [18], and the World Health Organization (WHO) estimates that maternal stress and depression levels in developing countries will increase from 15% to 57% [22].

It was also stated that Moringa extract in the form of biscuits could increase body weight and upper arm circumference in malnourished pregnant women. It can also prevent LBW and increase their nutritional intake [11] through antioxidants provisions [23]. They are often exposed to psychosocial stress, which leads to worsening pregnancy conditions [24]. Moringa extract can be found in various forms such as moringa honey, seed oil, and capsules.

Regarding the moringa content, other studies showed that pumpkin seeds also have a positive effect on pregnant women. Pumpkin seeds are often considered leftovers, even though their nutritional contents such as protein, fiber, unsaturated fat, and phytosterols are good for consumption [25]. Furthermore, they prevent kidney stones, relieve depression, prevent

osteoporosis and nourish the skin. Pregnant women are often associated with Postpartum Depression (PPD), and it occurs in nearly 15%. Fresh pumpkin has a fairly complete nutritional content consisting of carbohydrates, protein, fiber, and several minerals such as calcium, phosphorus, iron, and Vitamins B and C. Pumpkin also contains carotene which has functional properties as an antioxidant, so it can inhibit the oxidation process in the body. man. As the name implies, the pumpkin has a yellow or orange color due to its very high carotenoid content. Hence, the pumpkin has an important role in preventing disease [26]. PPD is mostly caused by anxiety and depression due to a lack of social and economic support as well as difficult childbirth experiences [27].

The prevalence of anxiety disorders in pregnant women ranges from 12.2% to 39% [28]. This disorder can be reduced by the consumption of pumpkin seeds. They are rich in excellent sources of potassium; dietary supplements in pumpkin seeds are also rich in influential potassium on stress reduction. This is because pumpkin also contains B Vitamins, Vitamin K, folate, and various antioxidants, such as anthocyanins, lutein, choline, and carotene. Thanks to its fairly complete nutritional content, pumpkin is good for consumption by anyone, whether it is children, adults, and pregnant women. The long-term effects of anxiety in pregnant women also affect their children's nervous disorders [29]. Anxiety contributes to sadness, loss of appetite, depressed mood, and loss of interest in doing something [28].

During this pandemic, pregnant women with weak immune conditions [30] are expected to use masks, wash hands and practice social distancing as well as eat food with high nutritional content [31], [32]. *Moringa oleifera* and pumpkin seeds are inexpensive and easy-to-obtain alternatives. Pumpkin seeds can be produced in the form of biscuits with fairly high nutritional value [33].

In addition, the WHO also considers depression and anxiety as one of the most serious illnesses in the world.

Conclusion

The results of this literature show that pumpkin seed biscuits and moringa capsules are highly recommended for consumption by pregnant women; besides being cheap, these foods are easy to obtain and very abundant, the content of these two foodstuffs can also prevent anemia, LBW, and the risk of death of pregnant women due to preeclampsia.

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