

Moringa oleifera non-conventional therapy to help breast milk production as an effort to achieve exclusive reastfeeding at the Deby Independent Midwife Practice, Medan City

Lasria Simamora¹, Mediana Beru Sembiring², Riska Susanti Pasaribu³, Riani Mawardah⁴, Titine Juniati Situmorang⁵

^{1,2,3}Prodi Pendidikan Profesi Bidan Program Profesi, STIKes Mitra Husada Medan, Medan, Indonesia

^{4,5}Prodi Kebidanan Program Sarjana, STIKes Mitra Husada Medan, Medan, Indonesia

ARTICLE INFO

Article history:

Received Sep 8, 2023

Revised Sep 23, 2023

Accepted Oct 6, 2023

Keywords:

Exclusive Breastfeeding
Moringa Leaves
Non Conventional
Therapy

ABSTRACT

Exclusive breastfeeding is an effort to improve the nutritional status of children in the first 1000 days of birth. Nationally, the percentage of babies aged less than 6 months who receive exclusive breastfeeding in Indonesia is 72.04%, for North Sumatra it is 57.17% and has still not reached the target of providing exclusive breastfeeding. The aim of this research is to determine the effectiveness of Moringa leaf juice in increasing breast milk production to reduce the use of modern medicine and support the achievement of exclusive breastfeeding. This research is a case control study using Moringa leaf juice which was carried out from May to August 2023. The research subjects were postpartum mothers who were willing to be samples. Patient data collection was carried out at the Deby Midwife Practice. The respondents were 30 postpartum mothers, of which 15 respondents were in the intervention group and 15 respondents were in the control group. The results of statistical analysis of the paired t test data showed a significance value (p) of 0.000 (<0.05) so it can be concluded that H_a was accepted and H_o was rejected, which means there was an increase in breast milk production after giving Moringa leaf juice. It is hoped that health workers involved in maternal and child health will promote the use of Moringa leaves to increase breast milk production.

This is an open access article under the [CC BY-NC](https://creativecommons.org/licenses/by-nc/4.0/) license.



Corresponding Author:

Lasria Simamora,
Prodi Pendidikan Profesi Bidan Program Profesi,
STIKes Mitra Husada Medan,
Sei Simare Street No.83, Medan, 20121, Indonesia,
Email: lasriasimamora@gmail.com

INTRODUCTION

Breast milk (ASI) is a fluid secreted by the mother's breast glands which consists of water, protein, carbohydrates, fat, vitamins, minerals, antibodies and enzymes. Breast milk is the first, main and best natural food for babies and is an important component in the baby's survival (Noviani, 2021). Babies are a period that is vulnerable to various diseases, and the golden period in children occurs between the ages of 3 years. If you are not sensitive to this, it will increase morbidity and mortality

in children which will have an impact on the nation's progress. Vitamin A and zinc deficiencies cause death; Iodine and iron deficiencies, along with stunting, can cause children not to reach their developmental potential. Suboptimal breastfeeding results in an increased risk of death in the first 2 years of life. One of the causes of 3.1 million child deaths every year or 45% of all child deaths in 2011 is suboptimal breastfeeding (Black et al., 2013). Exclusive breast milk is breast milk given to babies from birth for 6 (six) months, without adding and/or replacing it with other foods or drinks.

Various studies also state that children who are exclusively breastfed tend to have better cognitive abilities and are at lower risk of experiencing overweight/obesity and non-communicable diseases as adults. Apart from that, exclusive breastfeeding also provides benefits for mothers, because it reduces the risk of breast and uterine cancer. On the other hand, one of the challenges to the success of exclusive breastfeeding is that there are still many irresponsible promotions of breast milk substitute products (formula milk) (Badan Pendapatan dan Aset Daerah Provinsi NTT, 2023). Exclusive breastfeeding is one of the efforts to improve the nutritional status of children in the First 1000 Days of Birth (HPK). This is supported by the government policy regarding exclusive breastfeeding in Indonesia which was established in 2004 through the Republic of Indonesia Minister of Health Decree Number 450/Menkes/SK/IV/2004 and strengthened through Government Regulation Number 33 of 2012. Articles 6 and 7 emphasize that every mother who gives birth must give exclusive breast milk to the baby they give birth to unless there is a medical indication (Pemerintah Indonesia, 2021). Based on this, it can be concluded that the achievement of the target for exclusive breastfeeding in Indonesia should be 100%. Based on data from the Central Statistics Agency for 2022, the percentage of babies aged less than 6 months who receive exclusive breastfeeding in Indonesia is 72.04%, and for North Sumatra it is 57.17% (Badan Pusat Statistik, 2023).

Exclusive breastfeeding can be influenced by various factors. Some factors include the mother's level of education, knowledge, social norms, limited health system support, and marketing practices for formula milk, lactation problems (Mackenzie Green, Alissa M. Pries, Dian N. Hadihardjono, Doddy Izwardy, Elizabeth Zehner, Victoria Hall Moran, n.d.). Basically, lactation problems can be influenced by various things, including poor breast milk production which can be caused by the influence of breastfeeding hormones and also indirectly by the mother's low knowledge about ways or alternatives to increase breast milk production. Midwives as health service personnel, especially in the field of maternal and child health, can be important supporters in the lactation process. It is a requirement that midwives can also become innovators by using the latest methods to provide maternal care, one of which is using natural products such as Moringa leaves to increase breast milk production. In research conducted by Fungtamman & Phupong, (2021) stated that Moringa oleifera leaves are a herbal galactagogue that has been used to increase breast milk volume. Although giving 900 mg of Moringa leaves/day could not significantly increase the volume of breast milk in early postpartum mothers, the amount of breast milk in the Moringa group was 47% greater than in the control group. The rate of exclusive breastfeeding at 6 months in the Moringa oleifera group reached the goals set by WHO. Therefore, Moringa leaves (*Moringa oleifera*) can be used as a galactagogue concoction to increase breast milk volume. Likewise, research by (Zakaria et al., 2016) on the Effect Of Giving Moringa Leaf Extract With Moringa Leaf Flour On The Quantity And Quality Of Mother's Milk In Breastfeeding Mothers For Babies 0-6 Months, it was found that the increase in breast milk volume was higher in the group that received Moringa Leaf Extract compared to Moringa leaf flour, but has no effect on the quality of breast milk (iron, vitamin C and vitamin E). Exclusive breastfeeding that has not been achieved and also reducing the incidence of stunting can be attempted by processing Moringa leaves which contain phytosterols which can increase breast milk production for women who are breastfeeding which will be processed simply into juice, to make it easier for the community to process Moringa leaves to increase breast milk production. Theoretical implications relate to its contribution to the development of theories regarding health science insight, to provide promotive and preventive

efforts regarding the administration of *Moringa oleifera* leaf decoction to increase breast milk production in breastfeeding mothers. Meanwhile, the practical implications are input for health workers to use *Moringa* leaves as a non-conventional therapy to increase breast milk production

RESEARCH METHOD

Research Design

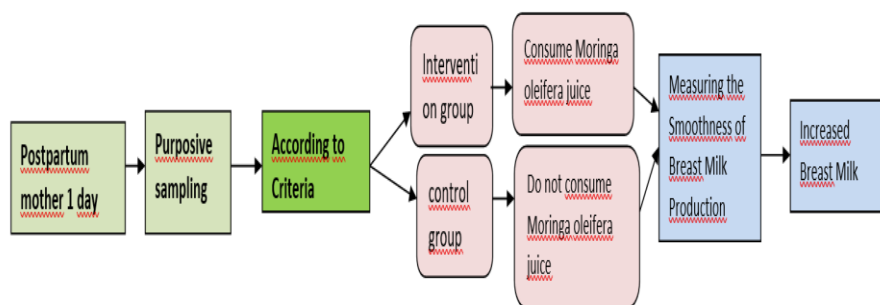


Figure 1. Research design

Time and location of research, This research was conducted in April 2023- July 2023 at the Deby Midwife Practice, Medan City.

Operational definition

A postpartum mother is someone who has given birth normally and intends to breastfeed exclusively for \geq the first day, drinking *Moringa* leaf juice (*Moringa oleifera*) are respondents who drink *Moringa* leaf juice, the increase in breast milk production is the result of measurements after drinking *Moringa* leaf juice and compared with respondents who did not drink *Moringa* leaf juice

Population and sample

The population is all postpartum mothers who gave birth to live babies at the Deby Midwife Practice. The samples were part of postpartum mothers who were willing to take part in this research and met the research criteria. For simple experimental research, the number of sample members is between 10-20 (Sugiyono, 2013) In this study, 15 respondents were given juice and 15 respondents were the control group, so the sample size in this study was 30 samples.

How to Measure

Postpartum mothers who met the criteria and were willing to be research samples during the research period were interviewed using a questionnaire to determine their characteristics. Then given *Moringa* leaf juice.

Providing *Moringa* leaf juice is done by preparing 50 grams of *Moringa* leaves, washing them clean and blending them by adding a glass of water (100 ml), then blending them consistently until they become juice and filtering them. You can also add enough brown sugar to add sweetness and drink regularly. every day after breakfast for 1 week.

Data analysis

After the data is collected, editing, coding, entry and cleaning are carried out. Next, data analysis was carried out in stages and carried out through a computerized process using SPSS. This univariate analysis carried out descriptive statistical tests to determine the frequency distribution or frequency table. In this study, the variables that have been described in the form of a frequency distribution are the characteristics of postpartum mothers which include: age, number of parities, highest level of education, mother's occupation. Bivariate analysis was used to determine the effect

of Moringa leaf juice on increasing breast milk production using the dependent t test (paired t test). The use of a paired test is to test the effectiveness of a treatment on a variable quantity that you want to determine. Before carrying out the t test, a data normality test was first carried out using Shapiro-Wilk because the sample size was less than 50 people. The value used for standard error is 0.05.

RESULTS AND DISCUSSIONS

This research is a case control study, namely by administering Moringa leaf juice to increase breast milk production in postpartum mothers. The analysis used in this research is univariate and bivariate which is presented in the following table.

Table 1. Frequency distribution of respondent characteristics

Respondent characteristics		Breast milk production	
		f	%
Age	20-35 years	27	90,0
	<20 years and >35 years	3	10,0
	Total	30	100
Parity	Primigravida	13	43,3
	Multigravida	17	56,7
	Total	30	100
Level of education	Higher education	28	93,3
	Low education	2	6,7
	Total	30	100
Work	Work	13	43,3
	Doesn't work	17	56,7
	Total	30	100
Breast milk production	Fluent	16	53,3
	Not fluent	14	46,7
	Total	30	100

Based on the table above, the characteristics of the respondents are known, it is known that the majority of respondents are of healthy reproductive age 20-35 years as many as 27 people (90%), as many as 17 people as multigravidas (56.7%), as many as 28 people with high education (93.3%), and not 17 respondents (56.7%) worked. Based on breast milk production, the majority of respondents breastfed smoothly, namely 16 respondents (53.3%).

Table 2. Normality test results

Measurement results	Group	Shapiro-Wilk		
		Statistik	df	Sig.
	Pre_Experiment	0.949	15	0.508
	Post_Experiment	0.927	15	0.246
	Pre_Control	0.932	15	0.293
	Post_Control	0.931	15	0.278

Based on the table above, it is known that the data is normally distributed, namely $p > 0.05$

Table 3. Paired samples test: giving moringa juice to breast milk production

Group	95% CI		t	df	Sig. (2-tailed)
	Lower	Upper			
Pretest Eksperimen - Posttest Eskperimen	-4.931	-3.469	-12.322	14	0.000

Based on the table above, the results of statistical analysis of the paired t test data show a significance value (p) of 0.000 (< 0.05) so it can be concluded that H_a is accepted and H_o is rejected, which means there is an increase in breast milk production after giving Moringa juice.

Moringa oleifera Lam. (*M. oleifera*), also known as drumstick or horseradish, is a perennial tree that belongs to the Moringaceae family (Yifan Bao a, 2020). *Moringa oleifera* is widely distributed in the tropical and subtropical regions. It is an edible plant with great nutritional value, which is rich in protein, vitamins, mineral elements and other nutrients. Different parts of *Moringa oleifera* Lam. can be cooked in different ways and eaten as vegetables or dietary supplementary. In addition, as a kind of high-quality edible raw material for improving metabolic disorder, *Moringa oleifera* Lam. attracts more and more researchers' attention. It has been demonstrated that *Moringa oleifera* Lam. has therapeutic effects of diabetes, and can ameliorate the abnormal carbohydrates and lipid metabolism of diabetic patients as well as alleviate metabolic syndrome (Melva Louisa, 2022).

Moringa oleifera Lam. is an edible therapeutic plant that is native to India and widely cultivated in tropical countries. In this paper, the current application of *M. oleifera* was discussed by summarizing its medicinal parts, active components and potential mechanism. The emerging products of various formats such as drug preparation and product application reported in the last years were also clarified. Based on literature reports, the unique components and biological activities of *M. oleifera* need to be further studied. In the future, a variety of new technologies should be applied to the development of *M. oleifera* products, to enrich the varieties of dosage forms, improve the bitter taste masking technology, and make it better for use in the fields of food and medicine (Su X, 2023).

Undernutrition contributes to up to 45% of deaths globally in children <5 years, with an optimal time for intervention before 24 months of age. Breastmilk microbiome helps establish the infant intestinal microbiome and impacts infant intestinal and nutritional health. Inadequacies in breastmilk composition such as low vitamin A contribute to infant nutrient deficiencies. Changes in milk fatty acid composition (reduced saturated and increased unsaturated fatty acids) may reduce susceptibility to enteric infection and increase protective intestinal bacteria. *Moringa oleifera* leaves (moringa) provide high nutrient concentrations (including protein, iron, vitamin A) and increase milk production; this may enhance breastmilk quantity and quality and improve infant health (Mogaka JN, 2022).

The results of this study are in accordance with (Nurulistyawan Tri Purnanto, Laily Himawati, Nur Ajizah, 2020) regarding the Effect of Moringa Leaf Tea Consumption on Increasing Breast Milk Production in Grobogan which states that breast milk production at the post test stage has a greater mean value than at the pre test stage, namely a difference of 6.50. This can mean that consuming Moringa leaves has been proven to be able to increase the amount of breast milk production in breastfeeding mothers. This increase is also supported by a p-value of 0.002 with a significance level of 0.934, which means it has a very strong influence. This means that regular consumption of Moringa leaves for 3 weeks (according to the intervention) has been proven to increase breast milk production in breastfeeding mothers. part from the Moringa leaf factor, there are several other factors that can influence breast milk production, including the mother's stress, tiredness from work, health conditions, poor production and the mother's own psychology.

Prolactin stimulates nutrients to synthesize milk in the secretory cells of the alveoli. Oxytocin causes contraction of the myoepithelium around the alveoli and releases milk (milk ejection). Cortisol, parathyroid and insulin hormones are needed to provide amino acids, fatty acids, glucose and calcium needed for the formation of milk. Increasing breast milk production can be done by administering galactagogum (Guyton A.C, dan Hall, J.E., 2014). *Moringa oleifera* (Moringa leaves) is a galactagogue food that has a high micronutrient content compared to other galactagogue foods, the nutritional content such as phytosterols, polyphenols and steroids (lactagogue effect) plays a role in the prolactin reflex and increases prolactin hormone levels, thereby stimulating the alveoli to produce breast milk (Nurjanah, S.N., Maemunah, A. S., & Badriah, 2013).

Many factors influence breast milk production, namely nutrition and non-nutrition. Nutritional factors include the mother's nutritional status and nutritional intake, while non-

nutrition factors include hormonal factors, mother's age, parity, gestational age, mother's and baby's health, mother's habits (smoking and alcohol consumption), Early initiation of breastfeeding, breast milk production, and the mother's psychological state. Nutritional and hormonal factors are the main factors that influence the synthesis and secretion, as well as the release of milk.

The Moringa plant is a local food ingredient that has the potential to be developed in culinary applications for breastfeeding mothers because it contains phytosterol compounds which function to increase and facilitate breast milk production (lactagogum effect). One compound that has a lactagogum effect is sterol. Sterols are compounds in the steroid class. Moringa leaf extract contains vitamin A 16.3 mg/100 grams, Fe 5.49 mg/100 grams, sitosterol 1.15%/100 grams, and stigmastetol 1.52%/100 grams. The World Health Organization (WHO) crowned Moringa as a miracle tree, after conducting studies and finding that this plant has been useful as a cheap health enhancer for more than 40 years in the poorest countries in the world (Krisnadi AD., n.d. (2012).

Tanaman kelor (*Moringa Oleifera*) merupakan tanaman tropis yang mudah tumbuh di daerah tropis seperti Indonesia. Sejak dahulu kelor sudah digunakan, faktanya daun kelor memang banyak mengandung zat yang sangat baik untuk tubuh. Bahkan ada yang menobatkan daun kelor sebagai mega superfood. Organisasi WHO menobatkan pohon kelor sebagai *miracle tree* setelah menemukan manfaat penting daun kelor. Daun kelor merupakan salah satu bagian dari tanaman kelor yang telah banyak diteliti kandungan gizi dan kegunaannya. Daun kelor sangat kaya akan nutrisi, diantaranya kalsium, zat besi, fosfor, kalium, zinc, protein, vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, vitamin K, asam folat dan biotinkalsium, zat besi, fosfor, kalium, zinc, protein, vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, vitamin K, asam folat dan biotin. Daun kelor juga mengandung berbagai macam asam amino, antara lain asam amino yang berbentuk asam aspartat, asam glutamat, alanin, valin, leusin, isoleusin, histidin, lisin, arginin, venilalanin, triftopan, sistein dan metionin (Aminah Syarifah, Tezar Rhamdan, Mufliani Yanis., 2015).

Moringa leaves are usually consumed as a vegetable, namely Moringa leaf vegetables. Several regions in Indonesia like to eat Moringa leaf vegetables which are apparently highly nutritious. The content of 100 grams of fresh Moringa leaves consists of 92 calories of energy; 6.8 grams of protein; 1.7 grams fat; 12.5 grams of carbohydrates; and 0.9 grams of fiber. Moringa leaves also contain several types of important vitamins. The vitamin content in 100 grams of fresh Moringa leaves includes 6.78 mg of carotene, vitamin A; 0.06 mg thiamine (vitamin B1); 0.05 mg riboflavin (vitamin B2); 0.8 mg niacin (vitamin B3); and 220 mg of vitamin C. Fresh Moringa leaves also contain several minerals. The mineral content of fresh Moringa leaves consists of 440 mg calcium; 0.07 mg copper; 0.85 mg iron; 42 mg magnesium; 70 mg phosphorus; 259 mg potassium; and 0.16 mg zinc. To see the content of Moringa leaves, you can compare the amount of nutrients with the amount of nutrients from other food ingredients.

CONCLUSION

The results of independent statistical test data analysis obtained a significance value (ρ) of 0.000 (<0.05) so it can be concluded that H_a was accepted and H_o was rejected, which means there is a difference in breast milk production after giving moringa oleifera juice to postpartum mothers at the Deby Midwife Practice in 2023.

The limitations experienced in this research can be taken into account by future researchers to improve the results better, namely the number of respondents was only 30 people, which is certainly not enough to describe the real situation.

ACKNOWLEDGEMENTS

To: Kemenristekdikti for providing researchers with the opportunity to win research grants for novice lecturers. To the Husada Medan partner foundation which supports the implementation of the research as well as to the research team and to the community who participated in this research.

References

- Aminah Syarifah, Tezar Rhamdan, Mufliani Yanis. (2015). *Kandungan Nutrisi dan Sifat Fungsional Tanaman Kelor (Moringa oleifera)*. 5(30), 35-44. <https://adoc.pub/kandungan-nutrisi-dan-sifat-fungsional-tanaman-kelor-moringa.html>
- Badan Pendapatan dan Aset Daerah Provinsi NTT. (2023). *Laporan Kinerja Instansi Pemerintah Tahun 2022*.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., De Onis, M., Ezzati, M., Grantham-Mcgregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427-451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
- Fungtammasan, S., & Phupong, V. (2021). The effect of Moringa oleifera capsule in increasing breastmilk volume in early postpartum patients: A double-blind, randomized controlled trial. *PLoS ONE*, 16(4 April), 1-7. <https://doi.org/10.1371/journal.pone.0248950>
- Guyton A.C, dan Hall, J.E. (2014). *Buku Ajar Fisiologi Kedokteran* (Ermita I, Ibrahim I, Ed.; Edisi 12). Elsevier.
- Krisnadi AD. (n.d.). *Kelor, Super Nutrisi, E Book. Kelorina. Com. Pusat Informasi dan Pengembangan Tanaman Kelor Indonesia, LSM Media Peduli Lingkungan. Indonesia*. 2015. Blora.
- Mackenzie Green, Alissa M. Pries, Dian N. Hadihardjono, Doddy Izwardy, Elizabeth Zehner, Victoria Hall Moran. (n.d.). *Breastfeeding and breastmilk substitute use and feeding motivations among mothers in Bandung City, Indonesia*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8189241/>
- Mogaka JN, Owuor PM, Odhiambo S, Waterman C, McGuire MK, Fuchs GJ, Attia SL. Investigating the Impact of *Moringa oleifera* Supplemented to Kenyan Breastfeeding Mothers on Maternal and Infant Health: A Cluster Randomized Single-Blinded Controlled Pilot Trial Protocol. *JPGN Rep*. 2022 Aug 16;3(3):e237. doi: 10.1097/PG9.000000000000237. PMID: 37168619; PMCID: PMC10158460.
- Noviani, N. (2021). Edukasi Pemanfaatan Daun Kelor Menjadi Olahan Produk Pangan Untuk Menambah Nutrisi. *Amaliah: Jurnal Pengabdian Kepada Masyarakat*, 5(1), 60-64. <https://doi.org/10.32696/ajpkm.v5i1.695>
- Nurjanah, S.N., Maemunah, A. S., & Badriah, D. L. (2013). *Asuhan Kebidanan Post Partum Dilengkapi dengan Asuhan Kebidanan Post Sectio Caesarea*. Refrika Aditama.
- Nurulistyawan Tri Purnanto, Laily Himawati, Nur Ajizah. (2020). PENGARUH KONSUMSI TEH DAUN KELOR TERHADAP PENINGKATAN PRODUKSI ASI DI GROBOGAN. *Jurna Cendekia Utama*, 50, 4-6.
- Pemerintah Indonesia. (2021). *Implementasi Peraturan Pemerintah No. 33 Tahun 2012 Tentang Pemberian ASI Eksklusif* (Vol. 17, Issue 1, pp. 1-9). <https://doi.org/10.31101/jkk.2060>
- Persentase Bayi Usia Kurang Dari 6 Bulan Yang Mendapatkan Asi Eksklusif Menurut Provinsi (Persen), 2020-2022*. (2023). Badan Pusat Statistik Indonei. <https://www.bps.go.id/indicator/30/1340/1/persentase-bayi-usia-kurang-dari-6-bulan-yang-mendapatkan-asi-eksklusif-menurut-provinsi.html>
- Sugiyono. (2013). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Su X, Lu G, Ye L, Shi R, Zhu M, Yu X, Li Z, Jia X, Feng L. *Moringa oleifera* Lam.: a comprehensive review on active components, health benefits and application. *RSC Adv*. 2023 Aug 15;13(35):24353-24384. doi: 10.1039/d3ra03584k. PMID: 37588981; PMCID: PMC10425832.
- Zakaria, Hadju, V., As'ad, S., & Bahar, B. (2016). Pengaruh Pemberian Ekstrak Daun Kelor terhadap Kuantitas dan Kualitas Air Susu Ibu (ASI) Pada Ibu Menyusui Bayi 0-6 Bulan. *Jurnal MKMI*, 12(3), 161-169.
- Aminah Syarifah, Tezar Rhamdan, Mufliani Yanis. (2015). *Kandungan Nutrisi dan Sifat Fungsional Tanaman Kelor (Moringa oleifera)*. 5(30), 35-44. <https://adoc.pub/kandungan-nutrisi-dan-sifat-fungsional-tanaman-kelor-moringa.html>
- Badan Pendapatan dan Aset Daerah Provinsi NTT. (2023). *Laporan Kinerja Instansi Pemerintah Tahun 2022*.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., De Onis, M., Ezzati, M., Grantham-Mcgregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427-451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)

- Fungtammasan, S., & Phupong, V. (2021). The effect of *Moringa oleifera* capsule in increasing breastmilk volume in early postpartum patients: A double-blind, randomized controlled trial. *PLoS ONE*, 16(4 April), 1-7. <https://doi.org/10.1371/journal.pone.0248950>
- Guyton A.C, dan Hall, J.E. (2014). *Buku Ajar Fisiologi Kedokteran* (Ermita I, Ibrahim I., Ed.; Edisi 12). Elsevier.
- Krisnadi AD. (n.d.). *Kelor, Super Nutrisi, E Book. Kelorina. Com. Pusat Informasi dan Pengembangan Tanaman Kelor Indonesia, LSM Media Peduli Lingkungan. Indonesia*. 2015. Blora.
- Mackenzie Green, Alissa M. Pries, Dian N. Hadihardjono, Doddy Izwardy, Elizabeth Zehner, Victoria Hall Moran. (n.d.). *Breastfeeding and breastmilk substitute use and feeding motivations among mothers in Bandung City, Indonesia*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8189241/>
- Mogaka JN, Owuor PM, Odhiambo S, Waterman C, McGuire MK, Fuchs GJ, Attia SL. Investigating the Impact of *Moringa oleifera* Supplemented to Kenyan Breastfeeding Mothers on Maternal and Infant Health: A Cluster Randomized Single-Blinded Controlled Pilot Trial Protocol. *JPGN Rep*. 2022 Aug 16;3(3):e237. doi: 10.1097/PG9.000000000000237. PMID: 37168619; PMCID: PMC10158460.
- Noviani, N. (2021). Edukasi Pemanfaatan Daun Kelor Menjadi Olahan Produk Pangan Untuk Menambah Nutrisi. *Amaliah: Jurnal Pengabdian Kepada Masyarakat*, 5(1), 60-64. <https://doi.org/10.32696/ajpkm.v5i1.695>
- Nurjanah, S.N., Maemunah, A. S., & Badriah, D. L. (2013). *Asuhan Kebidanan Post Partum Dilengkapi dengan Asuhan Kebidanan Post Sectio Caesarea*. Refrika Aditama.
- Nurulistyawan Tri Purnanto, Laily Himawati, Nur Ajizah. (2020). PENGARUH KONSUMSI TEH DAUN KELOR TERHADAP PENINGKATAN PRODUKSI ASI DI GROBOGAN. *Jurna Cendekia Utama*, 50, 4-6.
- Pemerintah Indonesia. (2021). *Implementasi Peraturan Pemerintah No. 33 Tahun 2012 Tentang Pemberian ASI Eksklusif* (Vol. 17, Issue 1, pp. 1-9). <https://doi.org/10.31101/jkk.2060>
- Persentase Bayi Usia Kurang Dari 6 Bulan Yang Mendapatkan Asi Eksklusif Menurut Provinsi (Persen), 2020-2022*. (2023). Badan Pusat Statistik Indonei. <https://www.bps.go.id/indicator/30/1340/1/persentase-bayi-usia-kurang-dari-6-bulan-yang-mendapatkan-asi-eksklusif-menurut-provinsi.html>
- Sugiyono. (2013). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Su X, Lu G, Ye L, Shi R, Zhu M, Yu X, Li Z, Jia X, Feng L. *Moringa oleifera* Lam.: a comprehensive review on active components, health benefits and application. *RSC Adv*. 2023 Aug 15;13(35):24353-24384. doi: 10.1039/d3ra03584k. PMID: 37588981; PMCID: PMC10425832.
- Zakaria, Hadju, V., As'ad, S., & Bahar, B. (2016). Pengaruh Pemberian Ekstrak Daun Kelor terhadap Kuantitas dan Kualitas Air Susu Ibu (ASI) Pada Ibu Menyusui Bayi 0-6 Bulan. *Jurnal MKMI*, 12(3), 161-169.
- Nutraceutical or Pharmacological Potential of *Moringa oleifera* Lam Kou X, Li B, Olayanju JB, Drake JM, Chen N. *Nutrient* 2018 <https://pubmed.ncbi.nlm.nih.gov/29534518/>
- Kim DS, Choi MH, Shin HJ. *J Food Biochem*. 2020 Jul;44(7):e13282. doi: 10.1111/jfbc.13282. Epub 2020 May 20. Extracts of *Moringa oleifera* leaves from different cultivation regions show both antioxidant and antiobesity activities
- Manggul MS, Hidayanty H, Arifuddin S, Ahmad M, Hadju V, Usman AN. *c Sanit*. 2021;35 Suppl 2:S191-S195. doi: 10.1016/j.gaceta.2021.07.013. Biscuits containing *Moringa oleifera* leaves flour improve conditions of anemia in pregnant women