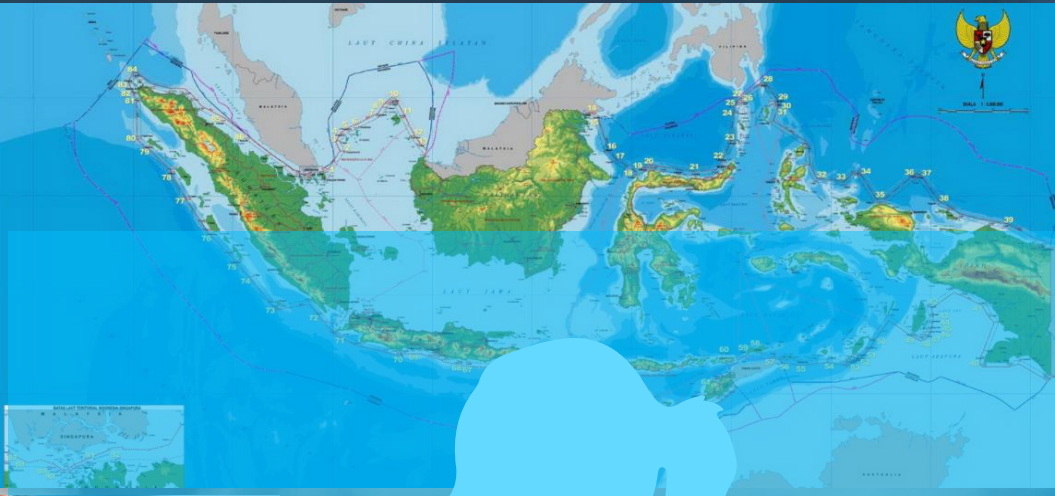


Preconception Studies in Indonesia

Conception



PRECONCEPTION

Lucy Widasari

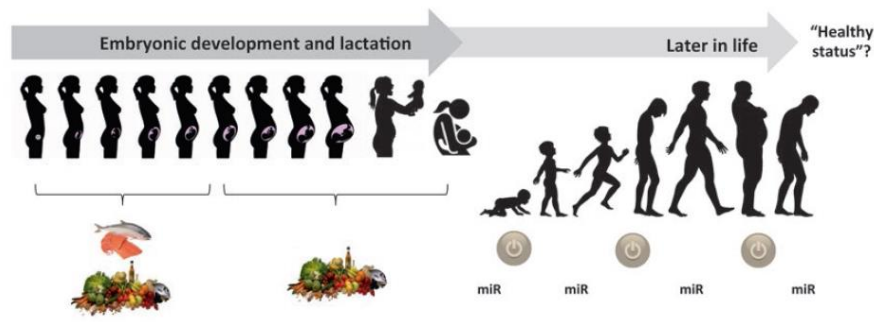
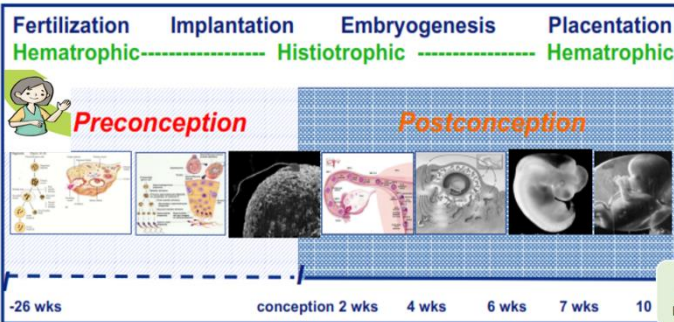
Evaluation Specialist, The Secretariat Of Accelerating Stunting Prevention
The Office Of The Vice President of Indonesia



Outline

- 01 Preconception Period
- 02 Preparation Since Preconception
- 03 Longitudinal Study : From Preparation to Molecular
- 04 Conclusion and Recommendation

Preconception Period



International Journal of Gynecology and Obstetrics 131 S4 (2015) S213–S253

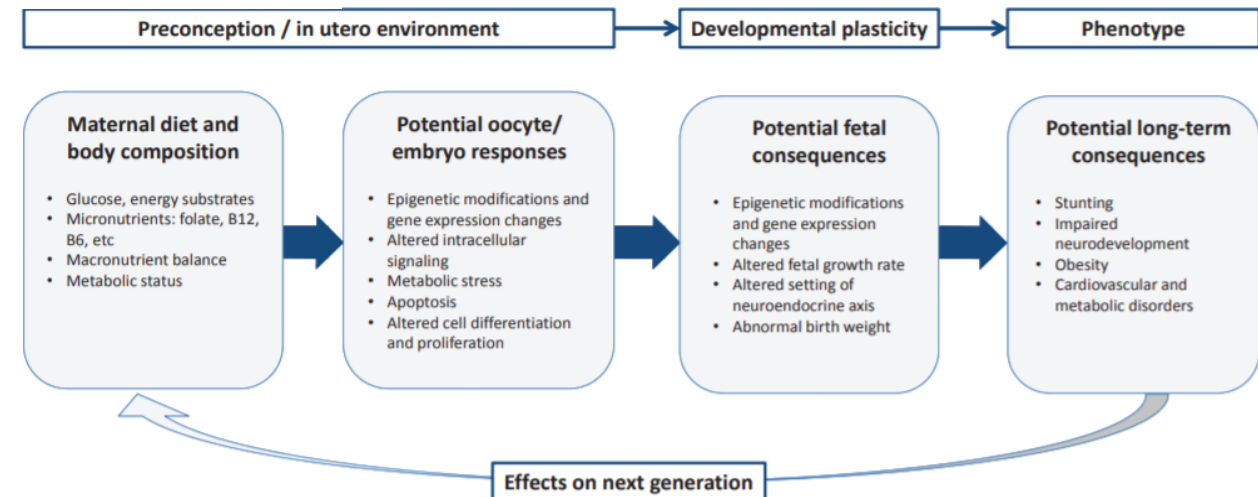
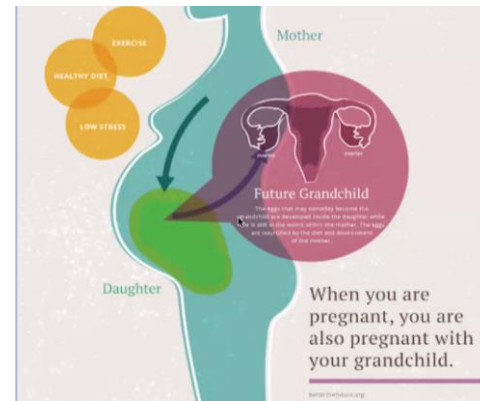
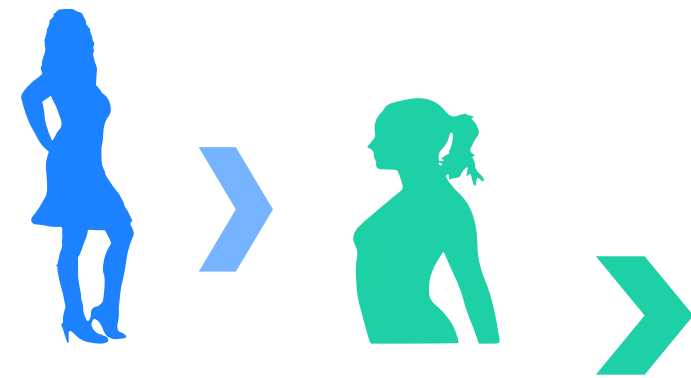
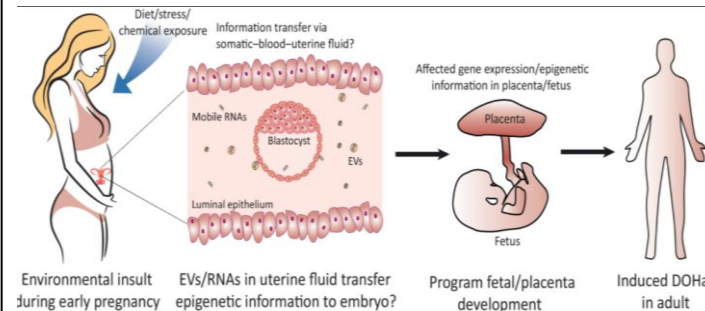


Figure 3 Effects of the preconception and in utero environment on offspring phenotype and future health. Maternal nutritional factors provide cues to the fetus during critical periods of developmental plasticity, triggering epigenetic and other responses that have lasting impacts on offspring health and that can be passed in a similar manner to the next generation.



Developmental Origins Of Health and Disease (DOHaD)
Barker Hypothesis, 1990

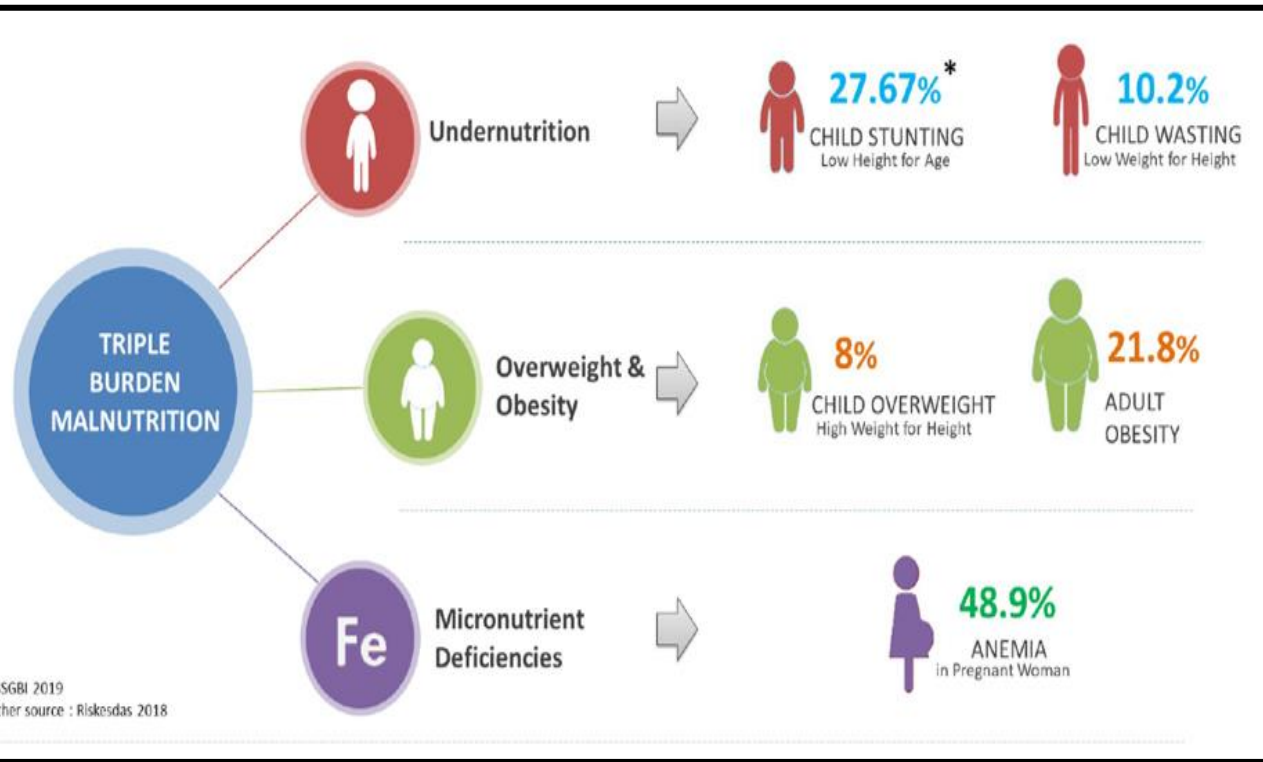
Developmental Origins Of Behaviour, Health and Disease (DOBHAD), Van Den Bergh, 2011

Preconception Period: anytime before pregnancy, up until the time of interview or recruitment

Periconception Period : 1 month (4 weeks) before conception up until 2-3 months of gestation or the period before conception, including : the period of conception, implantation, placentation and the stage of embryogenesis or organogenesis or called the early stages of pregnancy (early pregnancy).

Vahratian A, Siega-Riz AM, Savitz DA, and Thorp Jr. JM. Multivitamin use and the risk of preterm birth. *Am J Epidemiol.* 2003;160:886-892.

The Brain is extremely vulnerable to a suboptimal environment in the womb



Indonesian adolescent diet increases the risk of anemia

Source : Basic Health Research, 2018

Enferm Clin. 2020;30(56):76–80



Enfermería Clínica

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Anemia, chronic energy deficiency and their relationship in preconception women^{*}



Rahayu Nurul Reski^{a,*}, Veni Hadju^b, Rahayu Indriasari^b, Masyita Muis^c

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Received 8 November 2019; accepted 2 June 2020

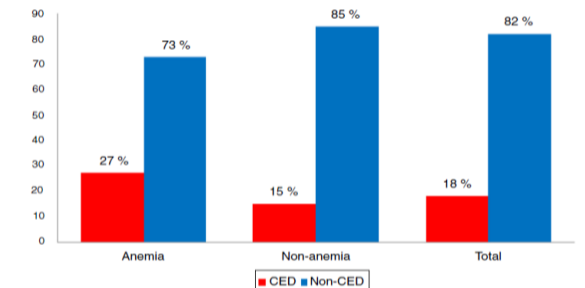


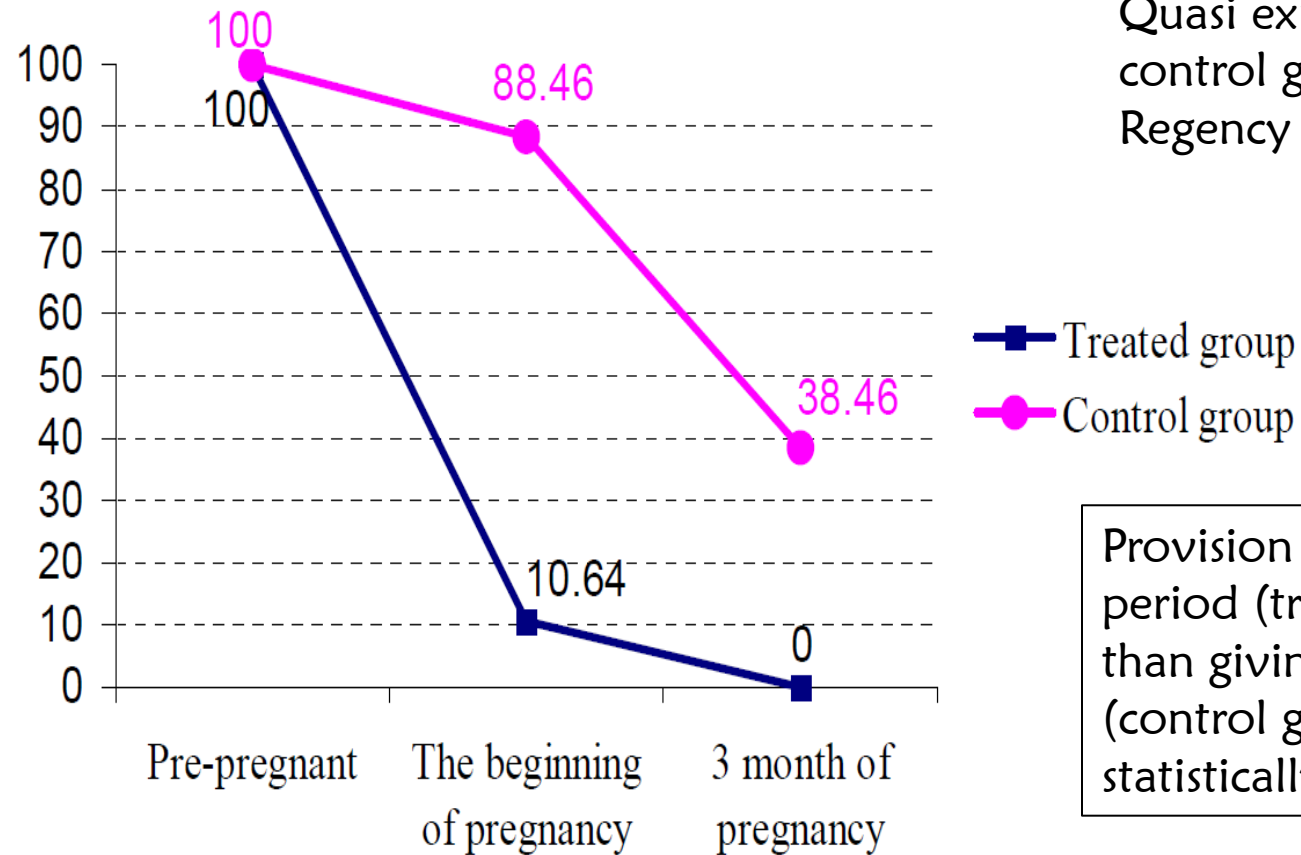
Figure 1 Relationship between anemia and chronic energy deficiency of preconception women ($P=0.018$).

A cross-sectional study : 300 preconception women in Takalar District, South Sulawesi, Indonesia.

Conclusion : The prevalence of anemia and chronic energy deficiency (CED) is still high in preconception women and there is a significant borderline between anemia and CED.

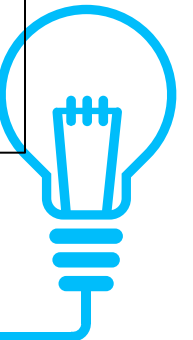
Comparison of the Effects of Pre-Pregnant Iron Supplements During Pregnancy in an Effort to Reduce Iron Deficiency Anemia in Pregnant Women with Mild Anemia in Bali

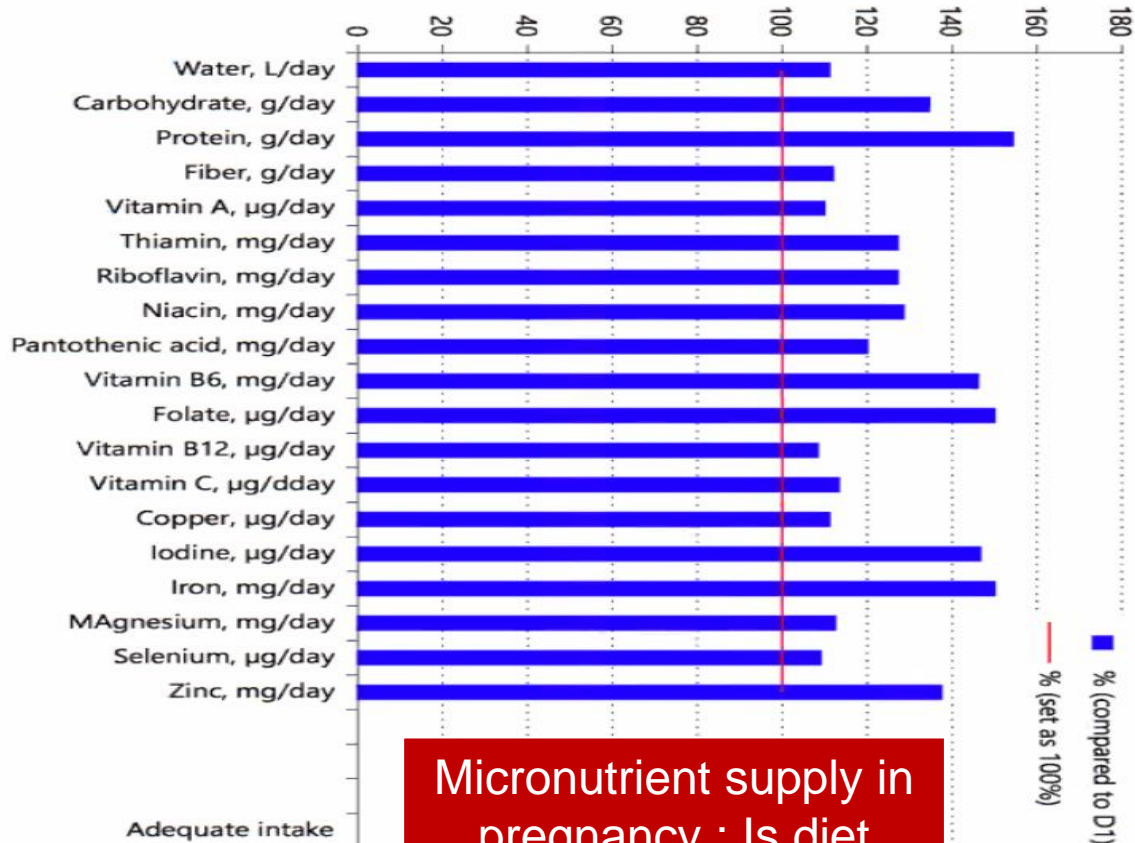
Luh Seri Ani, I Made Bakta, INT Suryadhi, N Agus Bagiada, Universitas Udayana 2007



Quasi experimental with randomized pre and post test control group design in Abiansema District, Badung Regency in May 2006 - January 2007

Provision of iron tablets from the pre-pregnancy period (treatment group) can prevent more IDA than giving iron tablets started in early pregnancy (control group) = 38.46%, the difference is statistically significant $p < 0.05$





Micronutrient supply in pregnancy : Is diet enough?

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Artikel Hasil Penelitian



Asupan Zat Gizi Dan Kadar Hemoglobin Wanita Prakonsepsi Di Kabupaten Semarang

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Gizi Indon 2020, 43(1):11-24

GIZI INDONESIA

Journal of The Indonesian Nutrition Association

p-ISSN: 0436-0265 e-ISSN: 2528-5874

KUALITAS DIET, STATUS GIZI DAN STATUS ANEMIA WANITA PRAKONSEPSI ANTARA DESA DAN KOTA

Diet Quality, Nutritional Status and Anemia among Preconception Women between Rural and Urban Areas

Cindy Fariski¹, Fillah Fithra Diény^{1,2}, Hartanti Sandi Wijayanti^{1,2}

¹Departemen Ilmu Gizi Fakultas Kedokteran Universitas Diponegoro

²Center of Nutrition Research (CENURE) Fakultas Kedokteran Universitas Diponegoro

E-mail: fillahdiény@gmail.com

Diterima: 11-01-2019

Direvisi: 09-11-2019

Disetujui terbit: 13-11-2019

The intake of micronutrients was still lacking, vitamin B2 (72.9%), zinc (68.6%), iron (92.9%), and folic acid (90%).



Nutritional requirements increase markedly during pregnancy, while some micronutrient requirements increase more than the energy

Am.Nutr Metab 2019 : 74::269-278 DOI:10.1159/000499698

The score of variation in the type of protein intake, total fat, and saturated fat was higher in rural areas than urban areas ($p=0,001$; $p=0,013$; $p=0,002$). The mean BMI and MUAC were higher in urban subjects than rural subjects but the hemoglobin levels of rural subjects were higher than urban subjects. The subjects of anemia in urban was 23,5 percent were higher than rural was 14,7 percent but the risk of chronic energy deficiency in rural was 55,9% were higher than urban was 11,8 percent. There were no differences in diet quality and hemoglobin levels between preconception women in rural and urban areas ($p=0,990$; $p=0,116$)

The International Federation Of Gynecology and Obstetrics (FIGO) Recommendations on Preconception and Maternal Nutrition “Think Nutrition First”

7

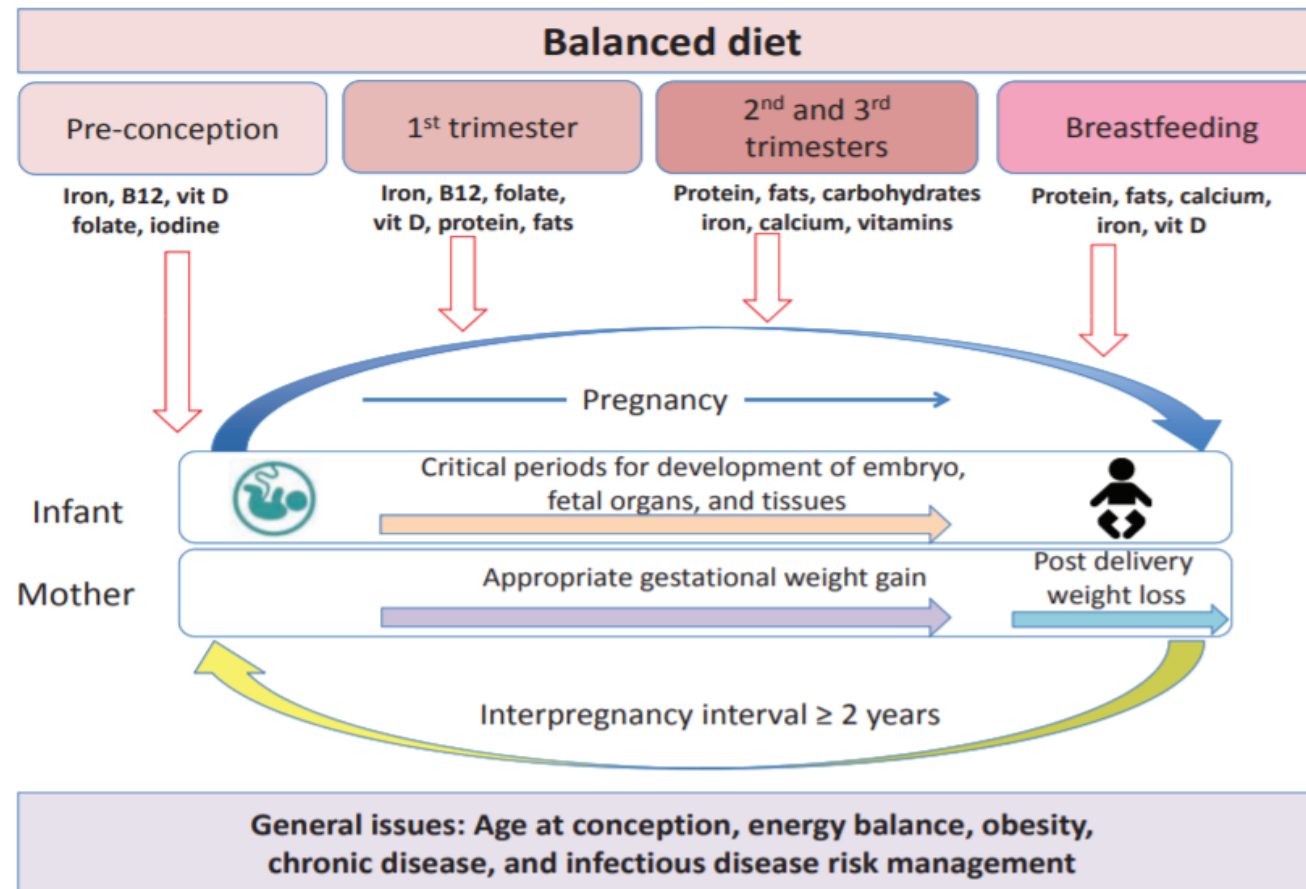


Figure 5 Examples of key nutritional issues for mother and baby through different stages of pregnancy.

Ideally, optimal nutrition will come **from food source**, but food fortification and or supplementation is advisable in some cases, particularly in low resource settings where women are undernourished

Journal of Nutrition and Dietetic Practice

RESEARCH ARTICLE

The Relation Between Jamu (Traditional Herbs) Consumption and Food Restriction (Taboo) Against Hemoglobin Level of Preconception Woman In Banggai Regency, Central Sulawesi Province

Lucy Widasari¹, Masrini T Chalid², Nurhaedar Jafar³, Abdul Razak Thahtar⁴

¹Doctoral Program Student, Hasanudin University, Perintis Kemerdekaan Street Km. 10, Makassar, Indonesia
²Obstetric and Gynecologic Department, Medical School Hasanudin University, Perintis Kemerdekaan Street Km. 10, Makassar, Indonesia
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⁴Professor Nutrition Science, Hasanudin University, Perintis Kemerdekaan Street Km. 10, Makassar, Indonesia

Abstract

Background: Nutritional status during preconception period is an important determinant of pregnancy outcome. Cultural norms, taboos, and beliefs are within the contextual factors that could potentially affect nutritional status and health in preconception women.

Methodology: The research was conducted in three districts of Banggai district, namely, Luvuk, North Luvuk, and South Luvuk. This study aims to identify relation between Jamu consumption (traditional herbs) and food restriction (taboo) against hemoglobin (Hb) value in preconception women in Banggai Regency in the year 2017. This study used cross sectional design with saturated sampling technique. The population in this study were 33 preconception women that meet the inclusion and exclusion criteria to judge the several factors that affect the value of Hb. Bivariate analysis using unpaired t test.

Results: The result show that mean hemoglobin levels average is 12.76 g/dl and the mean value 13.0 g/dl, with the lowest hemoglobin value of 7.1 g/dl, and hemoglobin highest value 15.9 g/dl. The test results of bivariate showed no significant difference in mean hemoglobin values among women whose consume herbs and women who did not (p = 0.753), there was no significant difference in mean hemoglobin values between groups of women with certain food restriction (taboo) and those who do not have restriction on certain foods (p = 0.233), there are no significant differences in mean hemoglobin values among women who do not consume herbs and those who consume herbs (p = 0.753).

Conclusion: It is important to be aware of the pharmacological content of the medication particularly when it is orally administered. Food taboos influence the amount, frequency and quality of nutrients as contributing factor against hemoglobin level and nutritional status of women before pregnancy. Hence, we need integrated and comprehensive approaches, with interventions to improve the overall health of the preconception women in this specific cultural context.

Keywords: Preconception, traditional herbs, taboo, hemoglobin

Food taboos influence the amount, frequency and quality of nutrients as contributing factor against hemoglobin level and nutritional status of women before pregnancy

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Kualitas diet, kurang energi kronis (KEK), dan anemia pada pengantin wanita di Kabupaten Semarang

Fillah Fithra Dieny¹, Firdananda Fikri Jauharany, Deny Yudi Fitranti, A Fahmy Arif Tsani, Ayu Rahadiyanti, Dewi Marfu'ah Kurniawati, Hartanti Sandi Wijayanti

Conclusion: the less protein and iron intake and lower upper arm circumference associated with a decrease in the bride's hemoglobin level

OPEN ACCESS

Indonesian Journal of Human Nutrition

P-ISSN 2442-6636

E-ISSN 2355-3987

www.ijhn.ub.ac.id

Artikel Hasil Penelitian

Asupan Zat Gizi Dan Kadar Hemoglobin Wanita Prakonsepsi Di Kabupaten Semarang

Annisa Khaira Maadi¹, Fillah Fithra Dieny^{1*}, Hartanti Sandi Wijayanti¹, A.Fahmy Arif Tsani¹, Choirunissa¹

¹ Program Studi Ilmu Gizi Departemen Ilmu Gizi, Fakultas Kedokteran, Universitas Diponegoro

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Diterima: April 2019

Direview: Juni 2019

Dimuat: Desember 2019

The conclusion is Hb level in preconception women was affected by energy, protein, iron intake and nutritional status. However, the most significant factors with Hb level were energy intake and nutritional status.

Acceptance of and Compliance with Multi-micronutrient and Iron-Folic Acid Capsules in Banggai District, Indonesia

Yustiyanty Monoarfa, Anang Otoluwa, Lucy Widasari, Rahayu Yekti, Halimah Habib, Retno Handajani, Kuntoro Kuntoro, Erry Gumilar, Bambang Wirjatmadi, Abdul Razak Thaha

Background : One obstacle to increasing compliance with multi-micronutrient (MMN) or iron-folic acid (IFA) supplementation in pregnant women is the side effects, such as a bad smell, nausea, vomiting, stomachache, or headache. To address this problem, in this study, IFA and MMN were each encapsulated in soft capsules, and we evaluated the compliance and acceptance reported by respondents.



Methods : This study was conducted in three sub-districts of Banggai district from October 2016 to February 2017. The subjects were preconception women who were newlywed and 18-35 years of age and who did not have serious diseases, such as tuberculosis, heart disease, or kidney failure. Both IFA and MMN tablets were crushed and then placed in capsule shells with the same color and size. The capsules were randomly delivered to the respondents, who consumed a capsule once per week unless they were menstruating, at which time consumption was daily. Of the 102 preconception women who were recruited, 40 were interviewed about consumption and any side effects that they felt. The level of pleasure was scored on a 3-point hedonic scale, and the response for each sensory quality, namely, color, odor, taste and size, was rated 2 or 3 (likable or very likable). The data were analyzed based on distribution and frequency.

Results : showed that 36 respondents (90%) consumed the capsules consistently, as recommended. As many as 38 respondents (95%) liked the color, 37(92.5%) described no odor, 37(92.5%) liked the flavor, and 37 (92.5%) liked the size. Ten respondents (25%) reported an increase in appetite, and 5 respondents (12.5%) reported deeper sleep. Approximately 4 respondents (10%) reported headache, and 2 (5%) complained of constipation.

Conclusion : Encapsulation of MMN or IFA may be an alternative approach for increasing compliance with consumption and reducing side effects.

Keywords : Compliance, Acceptance, MMN, IFA

The Level of Hemoglobin and the Mean Corpuscular Volume (MCV) among Preconception Women in Banggai Regency

9

Yustiyanty Monoarfa, Lucy Widasari, Rahayu Yekti, Anang Otoluwa, Endang Retnowati, Erry Gumilar, Abdul Razak Thaha, Bambang Wirjatmadi

Methods

The research was conducted in three sub-districts of Banggai district, from October 2016 to February 2017.

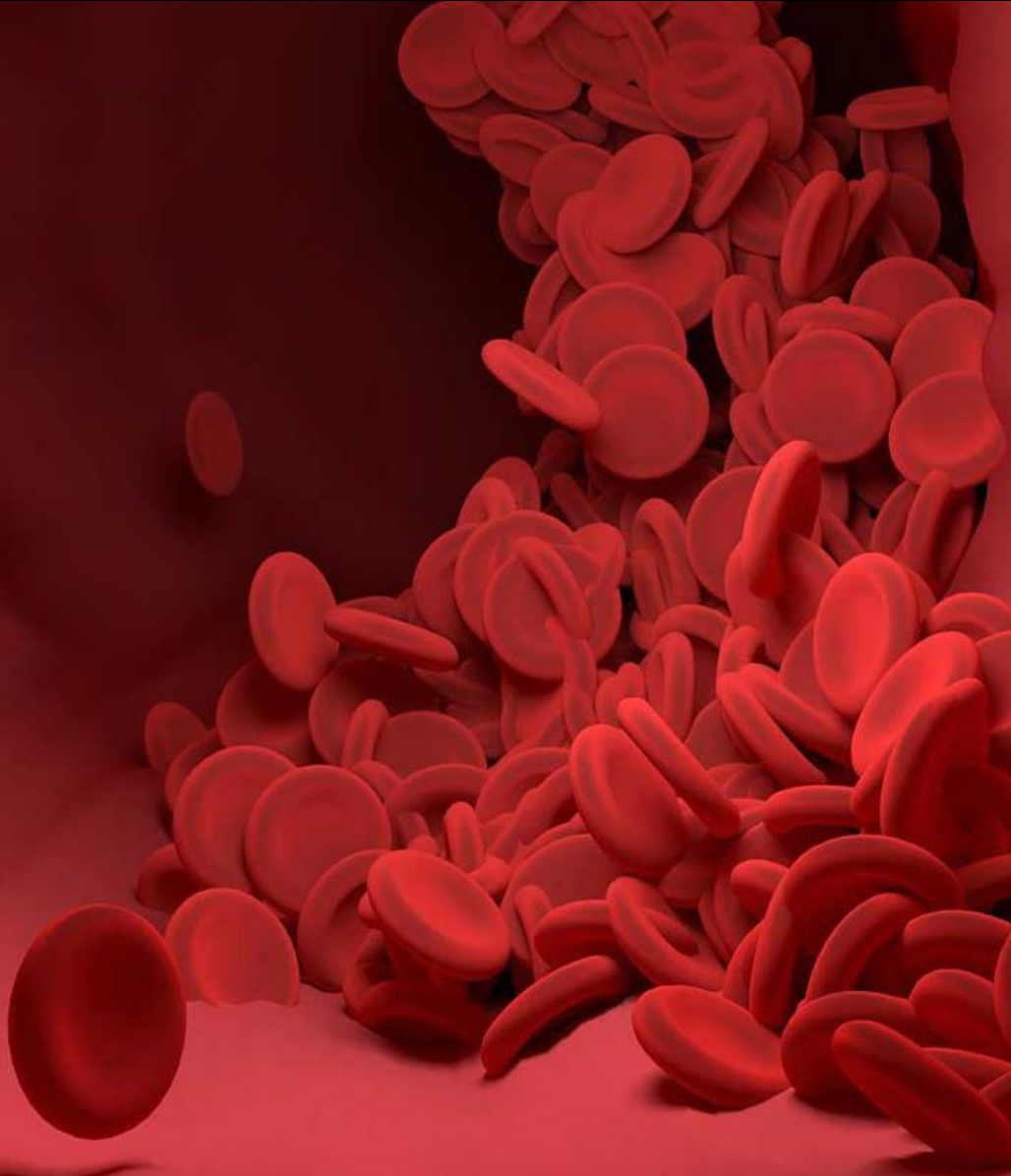
The subjects were newlywed preconception women who were visiting the religious affairs office to register their marriages; who were 18-35 years of age; and who did not have serious diseases, such as tuberculosis, heart disease, or kidney failure. A total of 102 preconception women were recruited. Venous blood samples were extracted, and hemoglobin and the MCV were measured using the SLS-hemoglobin method. The normal values for hemoglobin and the MCV are 12 g/dL and 80-100 fL, respectively

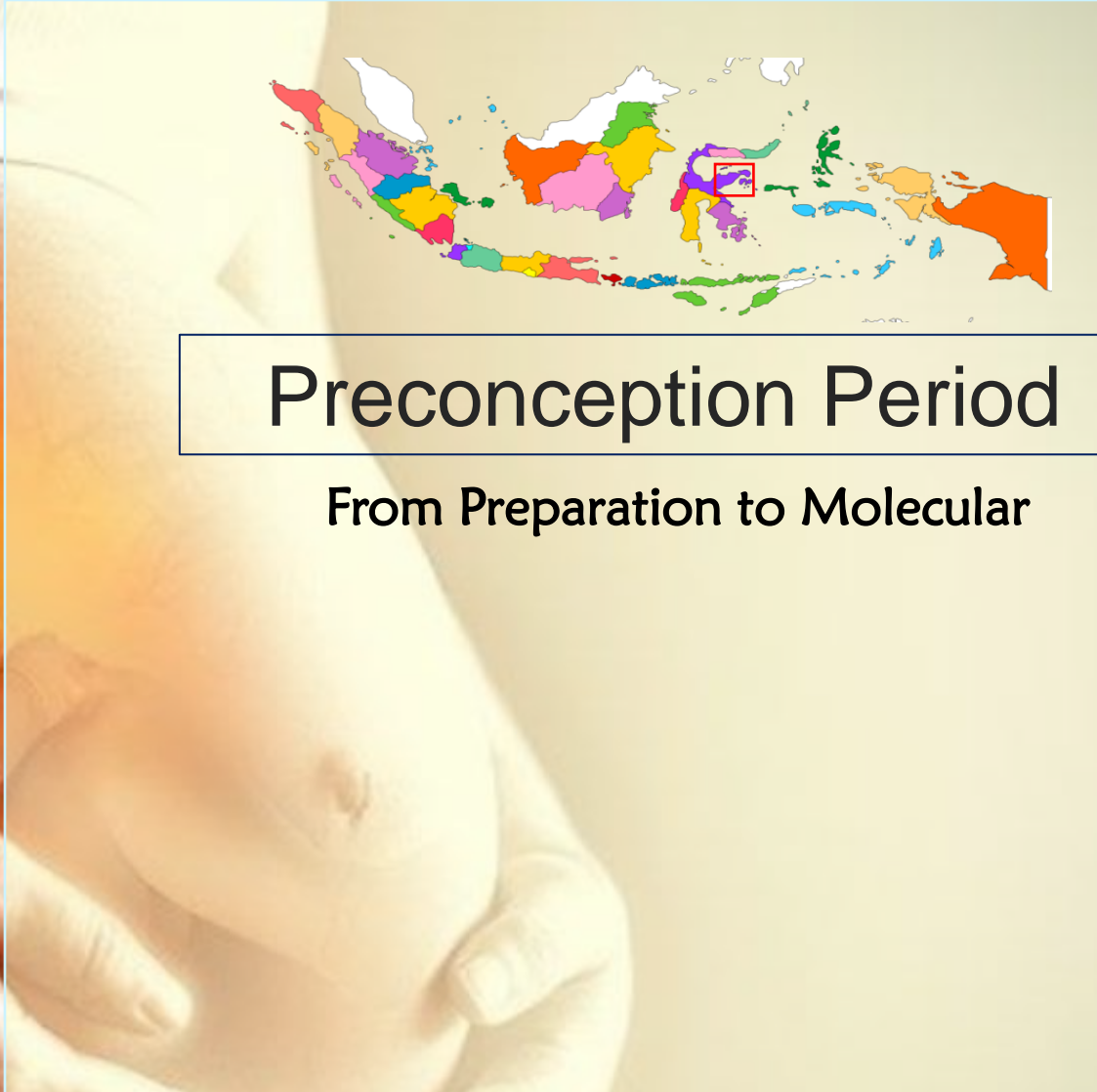
Results

The results showed that of 102 preconception women, 16 women (15.7%) had a hemoglobin level under 12 g/dL or reported anemia, and 21 women (20.6%) had an MCV below 80fL. Of the 16 women who had anemia, 12 women (57.14%) had an MCV under 80 fL, which indicated that their anemia was correlated with the iron parameters in red blood cells.

Conclusions

The results of study indicated that anemia is frequent in preconception women and that iron plays an important role in this anemia. This study indicates the importance of multi-micronutrient supplementation in preconception women





Preconception Period

From Preparation to Molecular



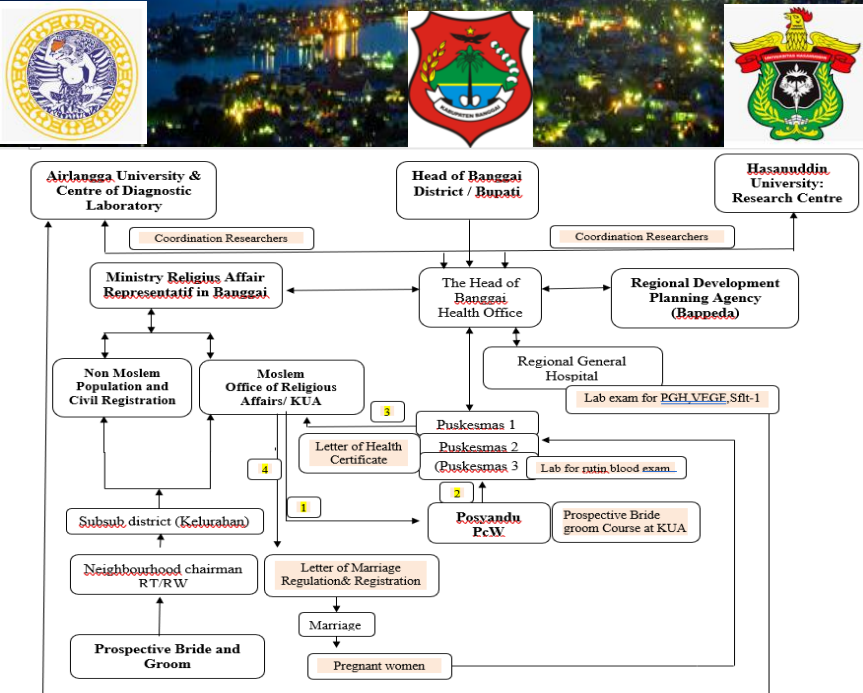


Figure 1. Schematic review Integrated Multisectoral Stakeholder-networking and Comprehensive Approaches and Interventions to Improve the Health of PcW in Banggai District

- The study was conducted in three sub districts in Banggai, Central Sulawesi, with double blind randomized controlled community based trial design from October 2016 to February 2017.
- During preconceptional period, the capsules was given once a week, while in pregnant women was once a day.
- Total sample of 19 preconception women aged 18-35 years old, did not have serious diseases, such as tuberculosis, heart disease, or kidney failure were followed up until pregnant and given IFA and/or MMN supplementation.
- The examination performed in the preconception period, the 12 weeks' gestation, 20 weeks' gestation and 38 weeks' gestation. At the 12th and 20th weeks of pregnancy, selenium was measured.
- Gestational age at baseline and subsequent prenatal visits were derived from the date of last menstrual period (LMP)
- Measurements of fetal size to report are FL (cm) between 22-24 weeks and 37-38 weeks gestation.
- A trained dietary interviewer obtained food intake information from the subjects via 24-h dietary recalls and questionnaires form
- Birth weight was measured using a Tanita Digital Baby Scale to the nearest 0.1 kilogram immediately after delivery at RSUD Luwuk the Regional Public Hospital
- The team of the first 1000 days of life provides 24-hour consultation services through android to ensure the consumption of capsule and question – answer of daily emerging issues during preconception period–positive pregnancy test up to the delivery.

One of the study strengths is great local government support and commitment along with the involvement of 2 universities

The Implementation Of Posyandu For Preconception Women in Banggai District Starting at The Office Of religious Affairs (KUA) to Meet SDGs Target in Banggai, Central Sulawesi

13

Lucy Widasari, Yustiyanty Monoarfa, Rahayu Yekti, Anang S Otoluwa, Abdul Razak Thaha



The Program was started by giving information to the bridegrooms (Kursus Calon pengantin, **SUSCATIN**) at the Office of Religious Affair (KUA) as a routine activities every Thursday while they are visiting the office for getting letter of marriage regulation. The main sector in this implementation was nutrition education by adding material on the importance nutrition for the first 1000 days of life and reproductive health once a week for prospective bridal couples. The activity is filled with pre and posttest for prospective bride and groom to asses the increase the knowledge of reproductive health and nutrition



Fig : SUSCATIN : giving information and pre-posttest to the bridegrooms (SUSCATIN) at the Office of Religious Affair (KUA)

Preparing Pregnancy Through Preconception Education Training

Ika Fauziah Priani, Yati Afiyanti, Wiwit Kurniawati

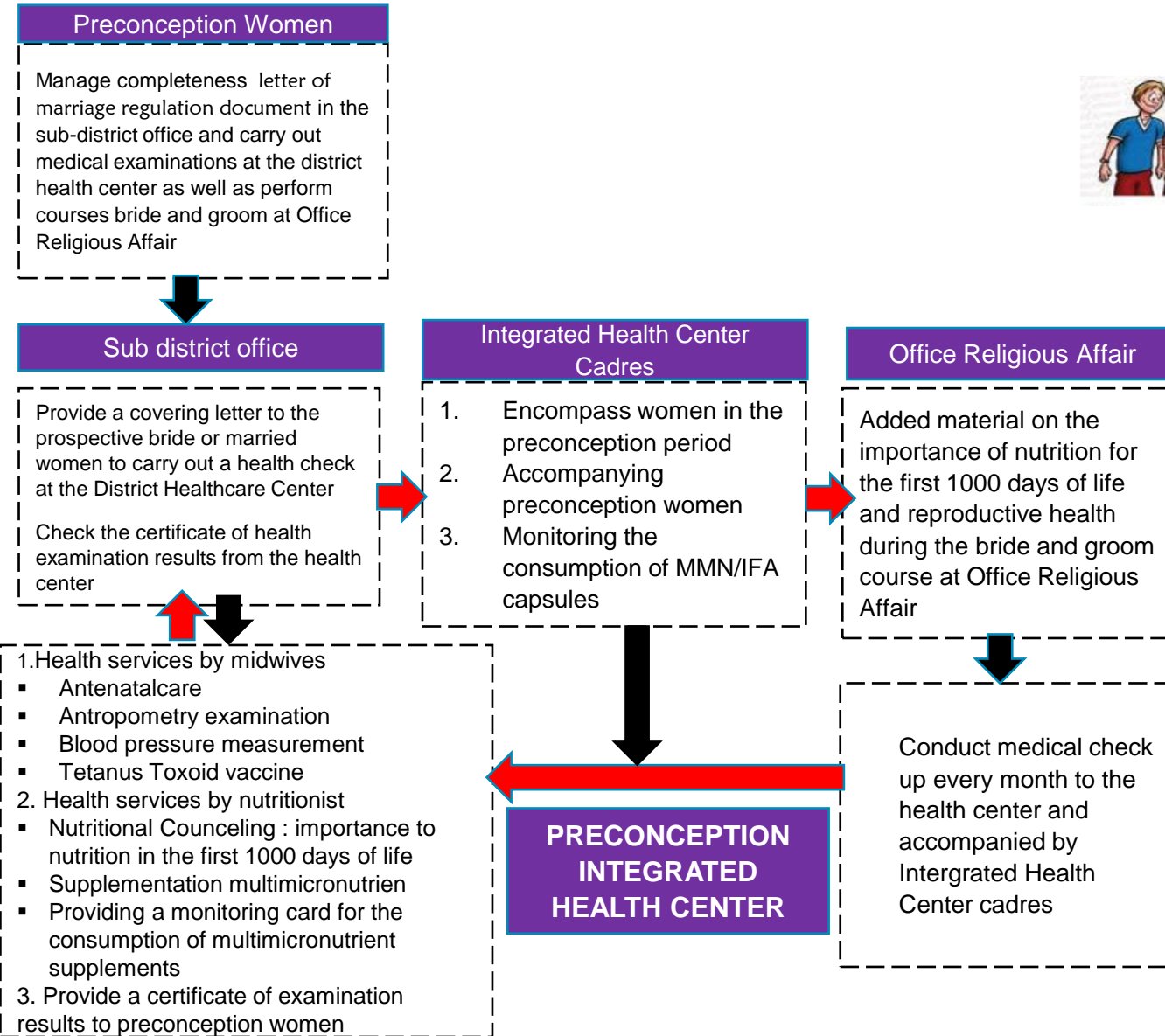
Preparing pregnancy through Preconception Education Training ☆

Ika Fauziah Priani, Yati Afiyanti, Wiwit Kurniawati

A quasi-experimental pre and posttest with control group study included 92 unmarried women in West Java, Indonesia. This study indicated a sig difference in post-intervention scores, with the intervention group scoring higher than the control group in overall preconception health knowledge such as physical health ($p < 0.001$), nutrition ($p < 0.001$), and lifestyle ($p < 0.001$).

Intervention MMN From Preconception for Prospective Brides in Banggai Central Sulawesi

Yustiyanty Monoarfa, Lucy Widasari, Rahayu Yekti, Anang Otoluwa, Abdul Razak Thaha



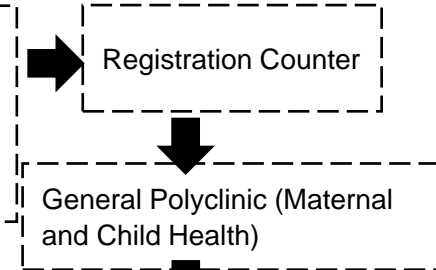
Intervention MMN From Preconception for Prospective Brides to Prevent Neonatal Stunting in Probolinggo District, East Java

15

Sri Sumarmi, Bambang Wirjatmadi, Kuntoro, Abdul Razak Thaha, Soekirman



The prospective bride and groom bring 3 copies of LADUNI cards (red, yellow, white) to the Puskesmas

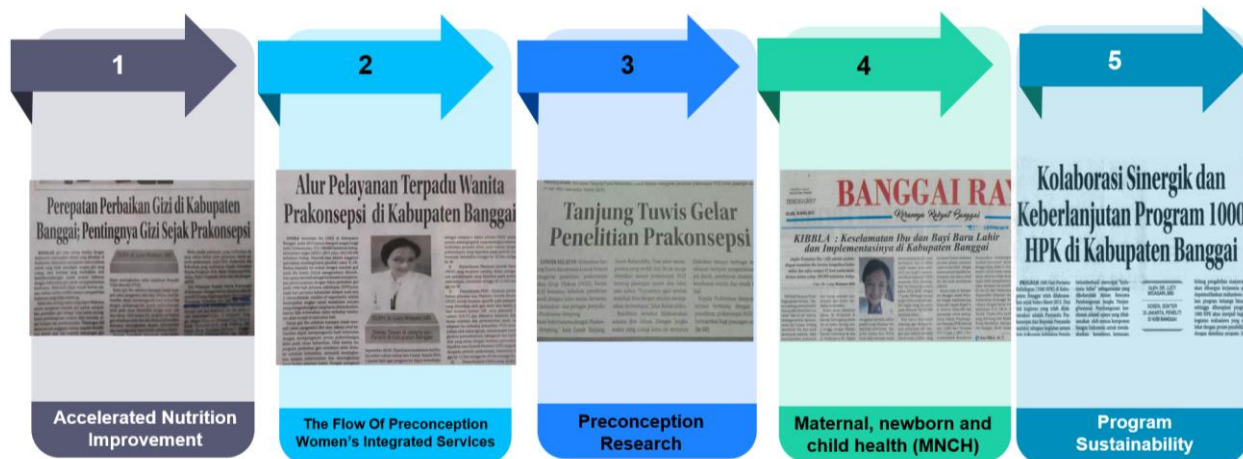


Composition of the UNICEF/WHO/UNU international multiple micronutrient preparation (UNIMMAP) and the iron and folic acid (IFA) supplement¹

Nutrient	Form	IFA concentration	UNIMMAP concentration	Unit
Vitamin A	Retinol equivalent	—	800	μg
Vitamin D	Cholecalciferol	—	200	IU
Vitamin E	Tocopherol	—	10	mg
Vitamin B-1	Thiamine HCL	—	1.4	mg
Vitamin B-2	Riboflavin	—	1.4	mg
Niacin	Nicotinamide	—	18	mg
Folic acid	—	400	400	μg
Vitamin B-6	Pyridoxine	—	1.9	mg
Vitamin B-12	Cyanocobalamin	—	2.6	μg
Vitamin C	Ascorbic acid	—	70	mg
Zinc	Zinc sulfate	—	15	mg
Iron	Ferrous fumarate	60	30	mg
Copper	Copper sulfate	—	2	mg
Selenium	Sodium selenite	—	65	μg
Iodine	Potassium iodide	—	150	μg

Previous research suggests that multivitamin use before and during pregnancy can diminish diet-related deficiencies of certain micronutrients and potentially prevent preterm birth

Vahratian A, Siega-Riz AM, Savitz DA, and Thorp Jr. JM. Multivitamin use and the risk of preterm birth. *Am J Epidemiol.* 2003;160:886-892.



Researcher team as a communicators should try to **popularize the first 1000 days of life programmes**. The media plays an important to encourage people to start health literacy, to raise awareness of healthy living behaviour as early as possible even before conception

Implementation of Integrated Service Management for Preconception Women in Banggai District

Siti Hadrayanti Ananda Harapin, Anang S Otoluwa, Abdul Razak Thaha

A-Qualitative Study in 3 districts of Banggai Regency, involving 35 Informants including: Officers, targets, and stakeholders : Head of Religious Affair (KUA), KUA Officers, Bupati, Head of Health Service, Health Service Staff, Head of Puskesmas, District Secretary, Head of Religion Department, Lurah, Village Head, Midwife, Empowerment and Family Welfare (PKK) Chair, Community Leader, and Women involved in integrated service for preconception women

Conclusion:

1. There was an increase in contact with the prenatal caregiver and the first contact (K1) examination for pregnant women.
2. The Integrated Services Management Program for Women Preconception is able and improves maternal knowledge.



Handbook of Preconception Women's Health Services



Examinations carried out in longitudinal studies

18

Abdul Razak Thaha, Bambang Wirjatmadi, Erry Gumilar, Nurhaedar Jafar, Maisuri T Chalid, Agussalim Bukhari, Anang Otoluwa, Yustiyanty Monoarfa, Rahayu Yekti, Lucy Widasari, 2016

Examination	Preconception Period	12 Weeks Gestation	20 Weeks Gestation	38 Weeks Gestation	Pregnancy Outcome
Maternal					
Blood Pressure Examination	√	√	√	√	
Urine Examination	√	√	√	√	
Body Weight	√	√	√	√	
Body Height	√				
Mid-upper Arm Circumference (MUAC)	√	√	√	√	
Dietary assessment					
Food Frequency Questionnaire (FFQ)	√	√	√	√	
Recall	√				
Placenta					
Placenta weight					√
Placenta diameter					√
The thickness of the placenta					√
Newborn baby					
APGAR Score					√
Birth weight of infant born					√
Length of infant born					√
Routine blood tests					
Hemoglobin, Erythrocytes, Leukocytes, Sedimentation rate	√	√	√	√	
Ultrasonography : BPD,HC,AC,FL		√	√		
Selenium status	√	√	√	√	
Antioxidant enzymes					
Glutathione peroxidase (GPx)	√	√	√	√	
Pro angiogenesis					
VEGF	√	√	√	√	
PIGF	√	√	√	√	
Anti angiogenesis					
SFlt-1	√	√	√	√	
Hormone					
PLGH	√	√	√	√	
Biomarker of oxidative stress					
8-OHDG	√	√	√	√	
MDA	√	√	√	√	
Mitochondrial					
Copy Mitochondrial	√	√	√	√	



Comparison of Body Mass Index in Women with IFA and MMN Groups since Preconception : A Randomized, Double Blind Controlled Trial in Banggai

Lucy Widasari, Yustiyanty Monoarfa, Rahayu Yekti, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha

Supplementation Group	Underweight		Normoweight		Overweight		Total	
	n	%	n	%	n	%	n	%
IFA	1	14.3	4	57.1	2	28.6	7	100
MMN	1	8.3	8	66.7	3	25.0	12	100
Total	2	10.5	12	63.2	5	26.3	19	100

BMI of preconception women in both IFAS and MMS groups were mostly (63.2%) in the normoweight category, 10.5% underweight and 26.3% overweight.

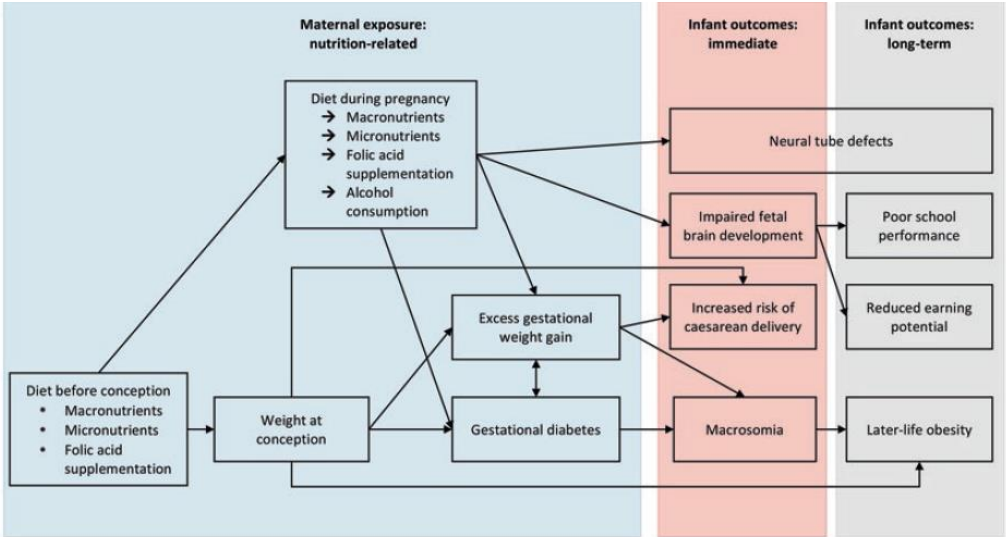
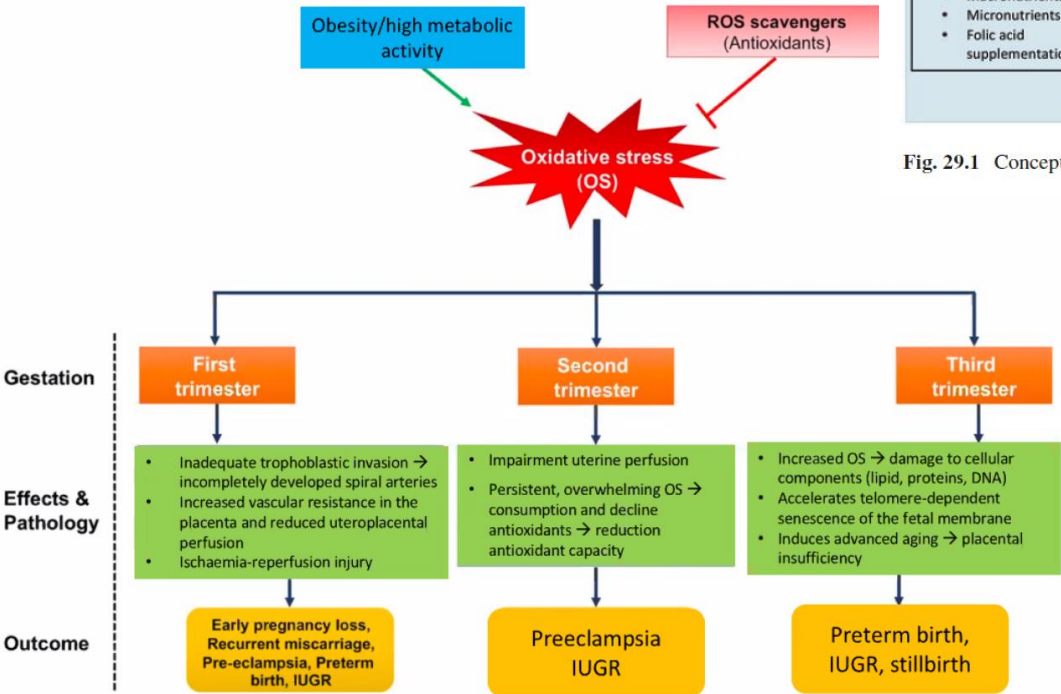


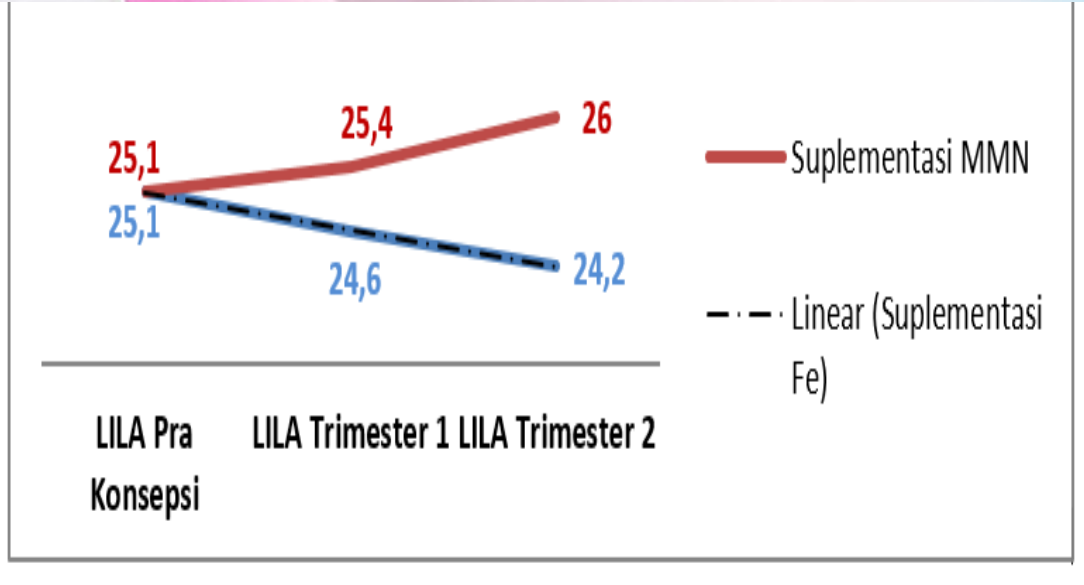
Fig. 29.1 Conceptual framework for issues of concern relating to maternal nutrition in Ireland

Rajkumar Rajendram, Victor R Preedy, Vinood B Patel. Diet, Nutrition and Fetal Programming, Humana Press p:395

Comparison of Mean Mid Upper Arm Circumference in Women with IFA and MMN Groups since Preconception

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha

Comparison of the mean MUAC of pregnant women in the IFA and MMN supplementation groups



- The average increase MUAC for pregnant women in the MMN group was higher than in the IFA group,
- There was a significant difference between the two groups of IFA and MMN in preconception with the second trimester of pregnancy ($p = 0.014$).

Maternal nutritional status, as estimated by anthropometrics, is an important contributor to and infant birth weight and fetal growth

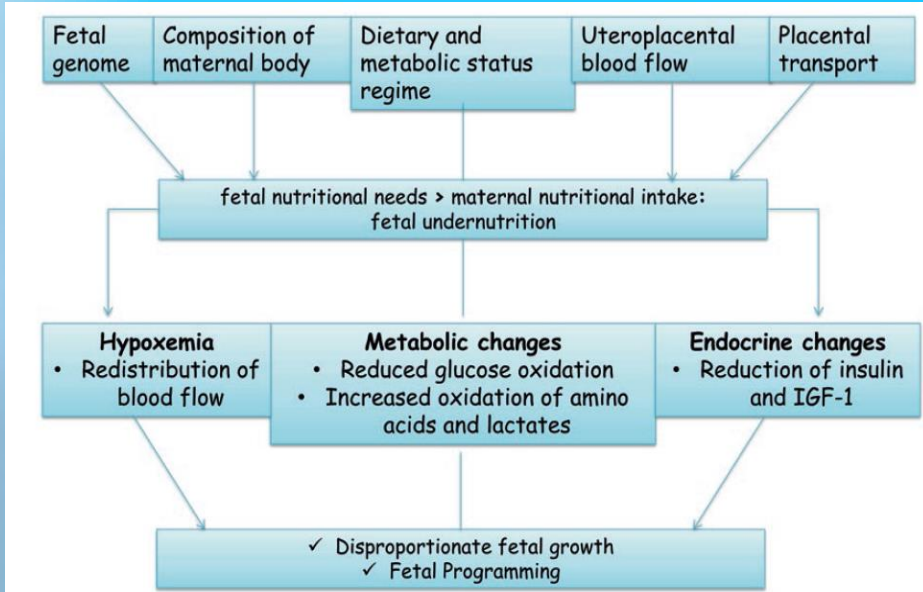


Fig. 24.4 Diagram explaining the maternal control of development and embryo-fetal programming

Malaysian Journal Nutrition 23 Supplement 1 st SEA PHN Conference 2017

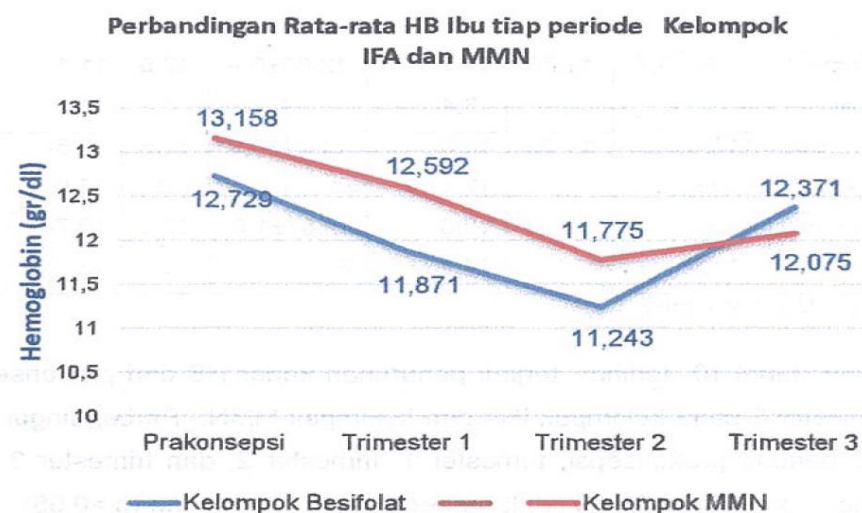
MUAC was measured at the midpoint between the olecranon and acromion process, to the nearest 0.1 cm using a nonstretchable insertion tape, while the arm hung freely at the side.

Rajkumar Rajendram, Victor R Preedy, Vinood B Patel. Diet, Nutrition and Fetal Programming, Humana Press p:335

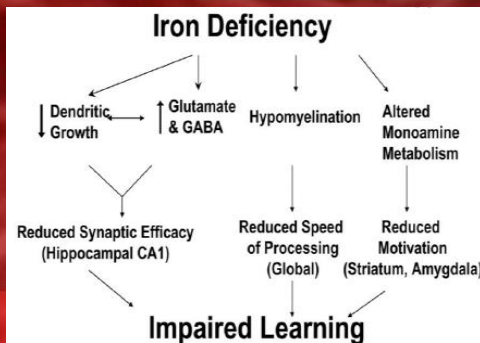
Effect Of Preconceptional Supplementation of IFA and MMN On Hemoglobin Level During Pregnancy

Rahayu Yekti, Lucy Widasari, Yustiyanty Monoarfa, Nurhaedar Jafar,
Agussalim Bukhari, Abdul Razak Thaha

Banggai, Central Sulawesi



The average hemoglobin level decreased from preconception to 2nd trimester of pregnancy. Comparison of levels hemoglobin between the IFA and MMN groups did not differ significantly.



Sri Sumarmi, Soenar Natalina Melaniani, Bambang Wirdjatmadi

Probolinggo, East Java

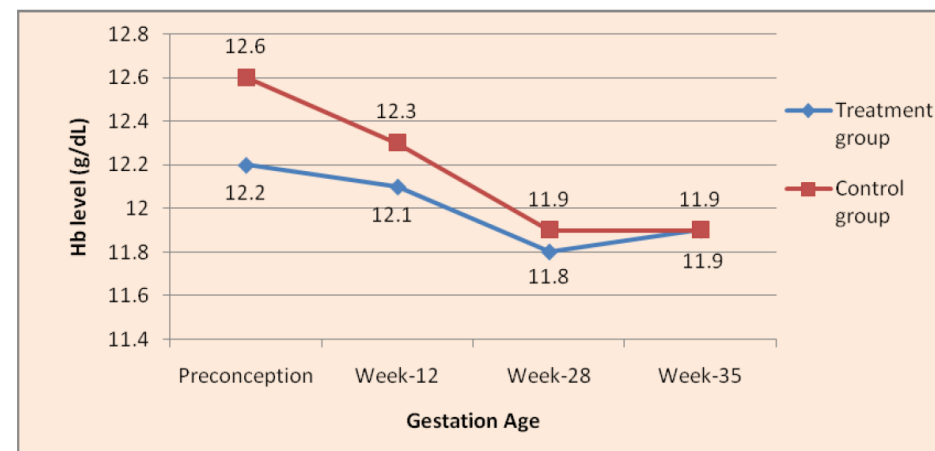
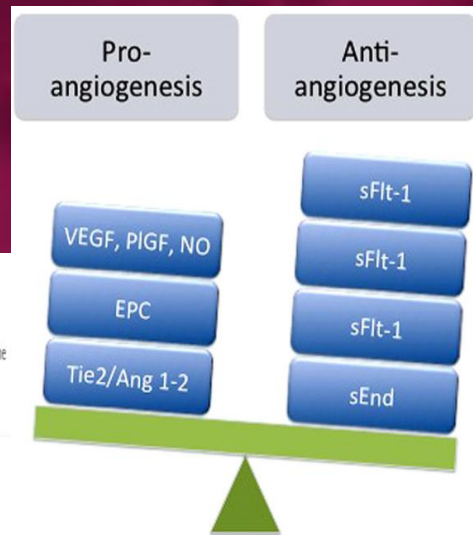
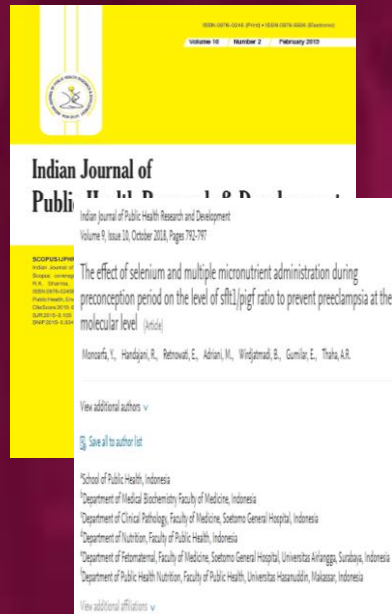


Figure 2. Average of hemoglobin concentration along gestation age between treatment (MMN) group and control (IFA) group.

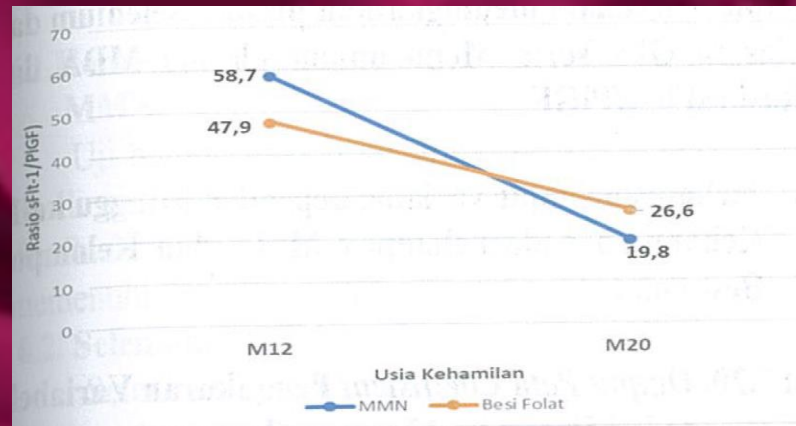
Average of hemoglobin concentration tends to decrease in both groups. The initial Hb level of subjects within IFA group (control group) is higher compare to those in MMN group (treatment group), with the mean difference of 0.4 g/dL, then decrease in week-12 with mean difference of 0.2 g/dL, continue decrease until week-28, with mean difference of 0.1 g/dL.

The Effects of Selenium And Multiple Micronutrient Administration During Preconception Period On The Level Of Sflt-1/PIGF Ratio To Prevent Preeclampsia At The Molecular Level : A Randomized, Double Blind Controlled Trial in Banggai Regency

Yustiyanty Monoarfa, Handajani R, Retnowati E, Adriani M, Wirdjatmadi B, Gumilar E, Abdul Razak Thaha



Comparison of mean SFlt-1 ratio at preconception, 12 and 20 weeks of gestation in the iron folate and MMN groups



The results :

- At the 12 weeks gestational age there was no significant differences in selenium values ($p=0,390$), SFlt-1/PIGF ratio ($p=0,464$) between the two groups
- At the 20 week gestational age **the increase in the SFlt-1/PIGF ratio in the IFA group is higher than the MMN group**

Placenta insufficiency and its poor obstetrical outcomes are correlated with an imbalance between angiogenic and anti-angiogenic factors. The soluble fms-like tyrosine kinase 1 (sFlt-1) to placental growth factor (PIGF) ratio, also called "the preeclampsia (PE)" fraction, was consecrated as the biomarker for PE detection.

Early prevention of preeclampsia can be conducted by observing preeclampsia markers before the occurrence of clinical symptoms and signs. It is expected that this study can contribute to the prevention of preeclampsia through nutrition intervention since the praconception period.

The Effects Of MMN and IFA Supplementation in Preconception Period Against Sflt-1/VEGF Ratio:

A Randomized, Double Blind Controlled Trial in Banggai Regency

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha

The mean Sflt1 / VEGF ratio of pregnant women in the MMN group was lower than in the IFA group, especially in the first trimester and the second trimester. There was a significant difference in the ratio between the two groups of IFA and MMN in each period ($p < 0.005$) except in the 1st-2nd trimester.

Sflt1 : VEGF	IFA Group (n=7)		MMN Group (n=12)		P value
	Δ Mean	SD	Δ Mean	SD	
Preconception	1,57	1,42	0,93	1,91	0,076
First Trimester	195,11	222,46	29,10	55,29	0,011
Second Trimester	114,09	445,05	18,94	29,29	0,001
Third Trimester	0,15	0,14	0,13	0,12	0,933
Third Trimester – Preconception					
Difference	-1,42		-0,80		0,003
P value	0,028		0,034		
Second Trimester – Preconception					
Difference	112,52		18,00		0,001
P value	0,018		0,015		
First Trimester – Preconception					
Difference	193,54		28,17		0,001
P value	0,018		0,019		
Third Trimester – Second Trimester					
Difference	-113,94		-18,81		0,001
P value	0,018		0,004		
Third Trimester – First Trimester					
Difference	-194,96		-28,97		0,001
P value	0,018		0,012		
Second Trimester – First Trimester					
Difference	-81,02		-10,17		0,809
P value	0,612		0,638		

In a deficient state of spiral artery supply, ischemia occurs which causes an increase in oxidative stress in the tissues, which causes a decrease in the ratio of CSE / H₂S (Cystathionine γ -lyase / Hydrogen Sulfide) as a regulator of several physiological events, including vasodilation, angiogenesis, antiapoptosis and cellular signaling.

This situation in turn causes an imbalance of angiogenic factors in pregnancy in the form of an increase in the Sflt-1 value and a decrease in the VEGF value. (Utpal Sen, 2012).

Comparison of Placenta Growth Hormone in Women with IFA and MMN Groups since Preconception : A Randomized, Double Blind Controlled Trial in Banggai Regency

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha



Variabel	IFA Group			MMN Group			P value
	(n=7)			(n=12)			
	Mean± SD	Median	Min ± Max	Mean±SD	Median	Min ± Max	
Preconception	1024,02 ± 564,22	857,54	155,48 ± 1965	1010,67 ± 919,54	769,19	6347± 9192	0,499
First Trimester	5325,71 ± 1782,02	4823		4058,95 ± 2618,68	3747,5		0,237
Second Trimester	7359,14 ± 1089,62	7903		7027,83 ± 2007,82	7688,5		0,866
Third Trimester	7553,86 ± 952,92	7764	423,68 ± 3811	7440,08 ± 1281,17	7200,5	5496 ± 9402	0,833

There was no significant difference in the mean PL-GH in the IFA and MMN groups in each trimester of pregnancy.

Hormonal factors, interactions of maternal immune cells and proinflammatory cytokines affect the success of spiral artery remodeling. Maternal hormones are not transferred to the fetus, so the fetus must synthesize its own growth hormone. Placental Growth Hormone (PL-GH) is a specific hormone of pregnancy produced by genes one family gene of the hormone human GH, namely placental GH variant (GH-V), plays in the trophoblast invasion and fetal growth, as well as maternal adaptation to pregnancy.

Periconceptional Multimicronutrient Supplementation For The Prevention Of Maternal DNA Damage

Anang S Otoluwa, Veni Hadju, Suryani As'ad, Yustiyanty Monoarfa, Abdul Razak Thaha

- Research in 4 sub-districts of Makassar City January 2012 - October 2014
- Double blind randomized controlled trial
- 240 samples recruited at preconception, 43 of them were pregnant and were divided into the intervention (MMN) 23 and control (IFA) groups 20.

Results:

- The average level of 8OHdG decreased in both the intervention (-70.6 ± 249.3 pg/ml; $p=0.47$) and control groups (-86.2 ± 234.6 pg/ml; $p=0.10$). However, these changes were not significant.
- The mean difference in 8OHdG levels between the two groups was also not significant ($p=0.57$).

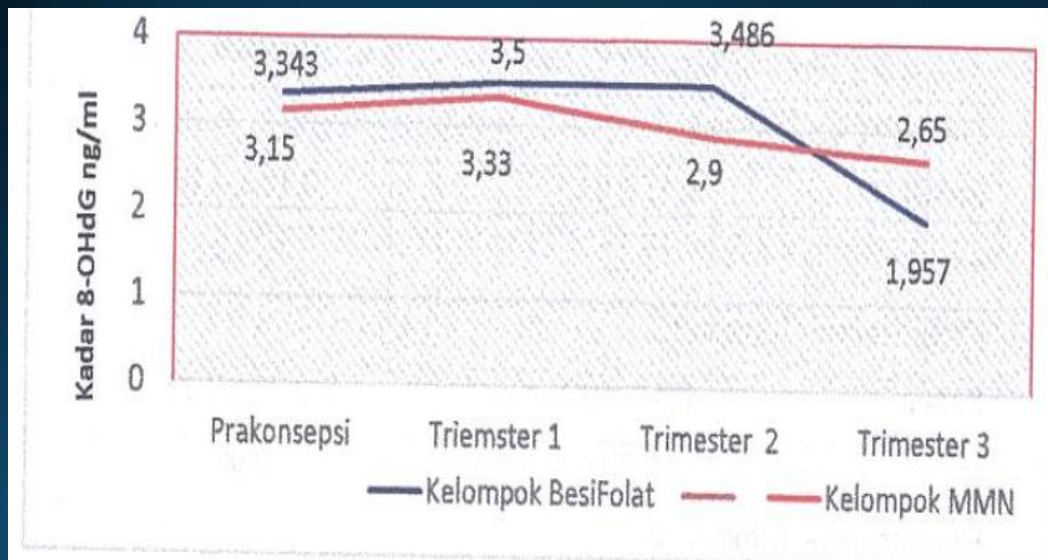
Conclusion: periconceptional MMN supplementation can prevent maternal DNA damage even though it does not produce significantly different results compared to IFA supplementation. **Future studies are needed**

Nutrition is very important to maintain the integrity of the genome because of its role as an enzyme cofactor or as part of a protein that plays a role in DNA synthesis and repair, prevention of DNA damage due to oxidative stress reactions, and maintain DNA methylation. Fenech, M. 2010. Micronuclei and Their Association With Sperm Abnormalities, Infertility, Pregnancy Loss, Pre-Eclampsia and Intra-Uterine Growth Restriction in Humans. Vol. 26 no.1 pp. 63-76.

Effects of Supplementation MMN and IFA Since Preconception on the level of 8-OHdG in Pregnant Woman

A Randomized, Double Blind Controlled Trial in Banggai Regency

Rahayu Yekti, Abdul Razak Thaha, Nurhaedar Jafar, Agussalim Bukhari



Comparison of changes in maternal OHdG levels between the IFA group and the MMN group

Results: In the MMN group there was a decrease in 8-OHdG from preconception to the 2nd trimester (-0.25) of pregnancy while the IFA group there was an increase in 8-OHdG (0.14), but did not differ sig ($p = 0.14$).

The reduction in 8 OHdG in the 3rd trimester of pregnancy was better in the IFA group than in the MMN group, but the mechanism is not yet known

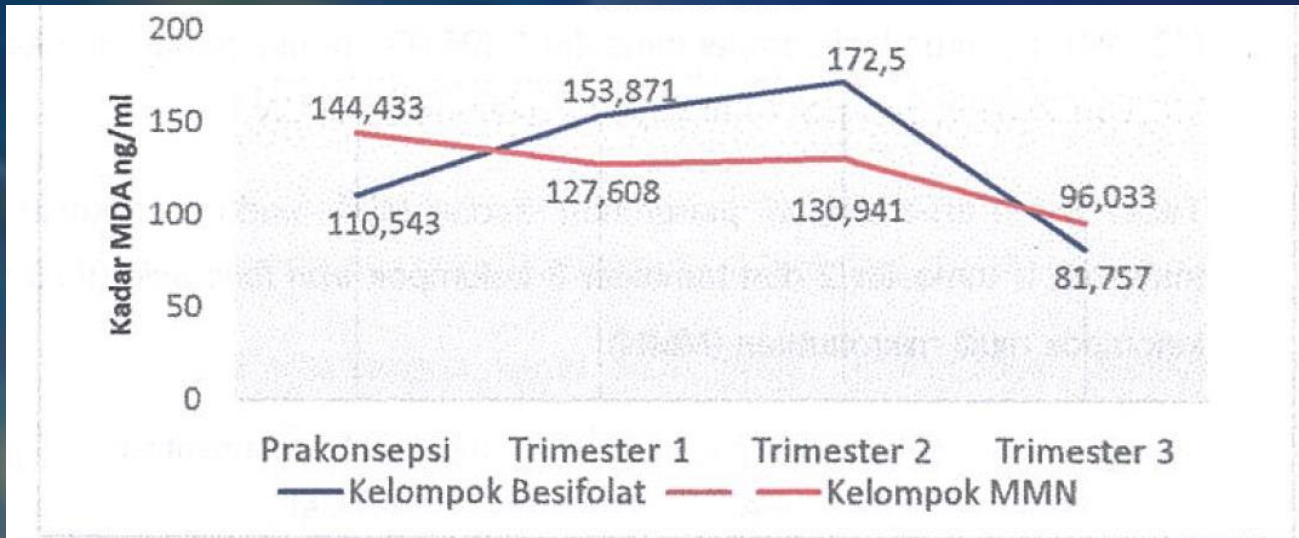
8-Hydroxy-2'-deoxyguanosine (8-OHdG), produced by oxidation of the nucleoside deoxyguanosine and subsequently excreted directly into urine, has been identified as a sensitive marker for oxidative DNA damage. Increased oxidative stress in human pregnancy has also been implicated in the pathogenesis of preeclampsia, preterm birth, intrauterine growth retardation and low birth weight deliveries

Erhola M, Toyokuni S, Okada K, Tanaka T, Hiai H, Ochi H, Uchida K, Osawa T, Nieminen MM, Alho H, Kellokumpu-Lehtinen P. Biomarker evidence of DNA oxidation in lung cancer patients: Association of urinary 8-hydroxy-20-deoxyguanosine excretion with radiotherapy, chemotherapy, and response to treatment. *FEBS. Lett.* 1997;409:287-291.

Loft S, Vistisen K, Ewertz M, Tjonneland A, Overad K, Poulsen HE. OxidativeDNA damage estimated by 8-hydroxydeoxyguanosine excretion in humans: influence of smoking, gender and body mass index. *Carcinogenesis.* 1992;13:2241-2247.

Effects of Supplementation MMN and IFA Since Preconception of content MDA in Pregnant Woman

Rahayu Yekti, Abdul Razak Thaha, Nurhaedar Jafar, Agussalim Bukhari



Grafik 2 : Grafik perbandingan rata-rata kadar MDA tiap periode dari periode prakonsepsi sampai trimester 3 antara Kelompok IFA dan MMN

Comparison of changes in maternal MDA levels between the IFA group and the MMN group

Results :

- The reduction in MDA from preconception to trimester 3 of pregnancy was greater in MMN (48,4) group compared to the IFA group (28,78) but not significantly different ($p=0,59$)
- The MMN supplementation given from preconception to the 38 week of pregnancy was able to reduce plasma MDA levels

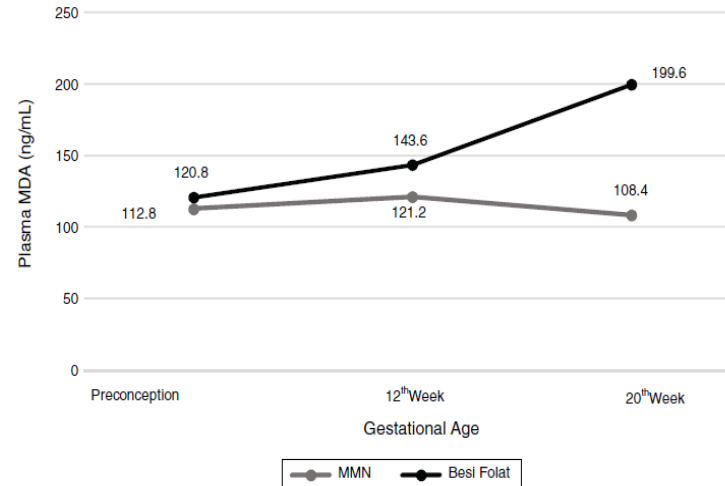
Malondialdehyde (MDA) is a product of lipid peroxidation and has been found to be elevated in conditions of oxidative stress.

Insufficient blood flow to the placenta may establish a hypoxic environment, which upon reoxygenation results in ischemia/reperfusion injury, characterized by increased free radical generation and subsequent oxidative tissue damage

The Effects Selenium and MMN Administration During Periconception Period On The Level Of Malondialdehyde: A Randomized, Double Blind Controlled Trial in Banggai Regency

Yustiyanty Monoarfa, Erry Gumilar, Lucy Widasari, Rahayu Yekti, Anang S Otoluwa, Abdul Razak Thaha

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Comparison of mean values of MDA in preconceptions, week 12 and week 20 in the Iron Folat Acid group and MMN group.

At the 12th weeks of pregnancy the level of MDA in MMN group was 121.2 ng/mL and IFA group was 1436 ng/mL, and at the 20th weeks in MMN group was 108.4 ng/mL and IFA group was 199.6 ng/mL.

There was a no significant difference between MDA in two groups ($p = 0.424$) at 12th week, but at 20th weeks MMN group had a significantly lower MDA levels ($p = 0.006$) than IFA group.

Conclusion: The administration of selenium in MMN preparations since the preconception period has a better effect in reducing MDA levels compared to the IFA group. This condition is very good in preventing oxidative stress in pregnancy and preeclampsia early.



The Effects of Supplementation MMN and IFA During Preconception on Mitochondrial DNA Content in Pregnant Woman

Rahayu Yekti, Abdul Razak Thaha, Nurhaedar Jafar, Agussalim Bukhari

Mitochondrial DNA	IFA Group Supplementation			MMN Group Supplementation			
	Mean \pm : SD	Median:	Min-max	Mean \pm SD	Median	Min-max	P ¹
3rd trimester of pregnancy	33,51 \pm 13,8	32, 79	19,26- 49,21	23,74 \pm 6,93	22,01	16,18- 37,69	0,15

Results: The IFA group had more copies of mitochondrial DNA content (1.5 times) : There was no significant difference in the number of copies of mitochondrial DNA content in the both groups in the 3rd trimester of pregnancy.

mtDNA content has been suggested as a marker of mitochondrial response to damage. Mt DNA is especially sensitive to oxidative stress and is more prone to damage than nuclear DNA since compared to nuclear DNA, mtDNA lacks histone proteins and introns and has lower DNA repair activity, due to the lack of nuclear excision repair (NER) in mitochondria (Meyeretal.,2013;Kazaket al.,2012).

Correlation Of Fetal femur Length, Birth Length Between IFA and MMN Since Preconception Period: A Randomized, Double Blind Controlled Trial in Banggai Regency

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha



Description Birth length on IFA and MMN supplementation Group

Birth length	IFA group supplementation (n=7)			MMN group supplementation (n=12)		
	Mean \pm SD	Median	Min \pm Max	Mean \pm SD	Median	Min \pm Max
	47,86 cm \pm 2,41	48 cm	50 cm \pm 43 cm	49,5 cm \pm 2,54	49 cm	55 cm \pm 46 cm
Birth length difference between IFA and MMN group						
Difference	1,64 cm					
95% CI	47,66 – 50,13					
P value	0,001					

Measurements of fetal size to report are FL (cm) between 22-24 weeks and 37-38 weeks gestation.

Description Femur Length (FL) at IFA and MMN supplementation Group

Mean	IFA group	MMN group
2 Trimester pregnancy		
FL	3,70 \pm SD 0,20	4,18 \pm SD 0,29
3 Trimester pregnancy		
FL	6,53 \pm SD 0,45	6,61 \pm SD 0,30

The average length of infants born to pregnant women in IFA group was 47,86 cm \pm 2,41 and in MMN group was longer, 49,5 cm \pm 2,51. The difference birth length of the IFA and MMN supplementation group amounted to 1.64 cm. There is no significant correlation of fetal FL in the 2nd and 3rd trimester of pregnancy with the birth length in each group (p>0.05).

Correlation Between Femur Length (FL) and Birth Length at IFA and MMN supplementation Group

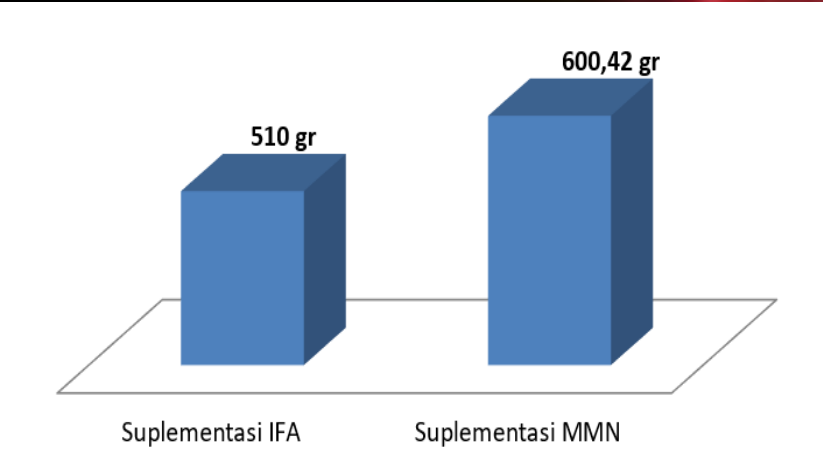
Variable	Birth Length (p value)	
	IFA group	MMN group
FL 2nd Trimester pregnancy	0,545	0,225
FL 3rd Trimester pregnancy	0,255	0,221

Conclusion: Femur length reflects the longitudinal growth of the fetus. Although there is no significant correlation in each group, mothers who received IFA intervention the fetus had shorter FL compared to MMN group.

Effects Of MMN and IFA Supplementation in Preconception Period Against Placental weight : A Randomized, Double Blind Controlled Trial in Banggai Regency

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha

Mean placental weight in the IFA and MMN supplementation groups



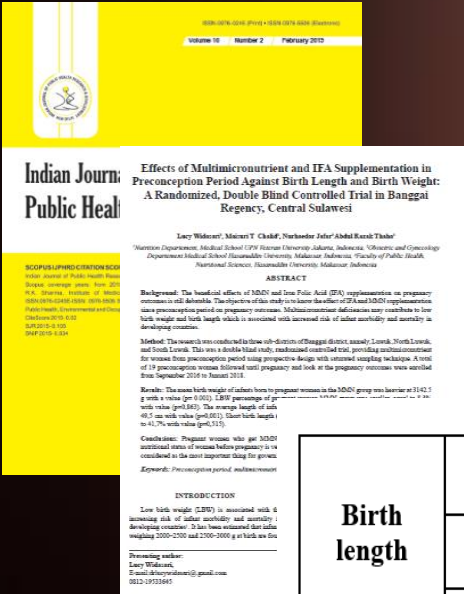
Placental weight, gestational age and gain body weight simultaneously influences birth weight. Among the three variables, placental weight has the greatest effect on birth weight, which is 57%.
(Sri Sumarmi, 2016)

Results: The mean placental weight of pregnant women in the MMN group was heavier than the IFA group, which was 600.42 gr and the results of statistical tests showed no significant difference between IFA and MMN groups ($p = 0.384$)



Effects Of MMN and IFA Supplementation in Preconception Period Against Birth weight and Birth Length: A Randomized, Double Blind Controlled Trial in Banggai Regency

Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha



The mean birth weight of infants born to pregnant women in the MMN group was heavier at 3142,5 g vs 2948 g with a value (p=0,001)

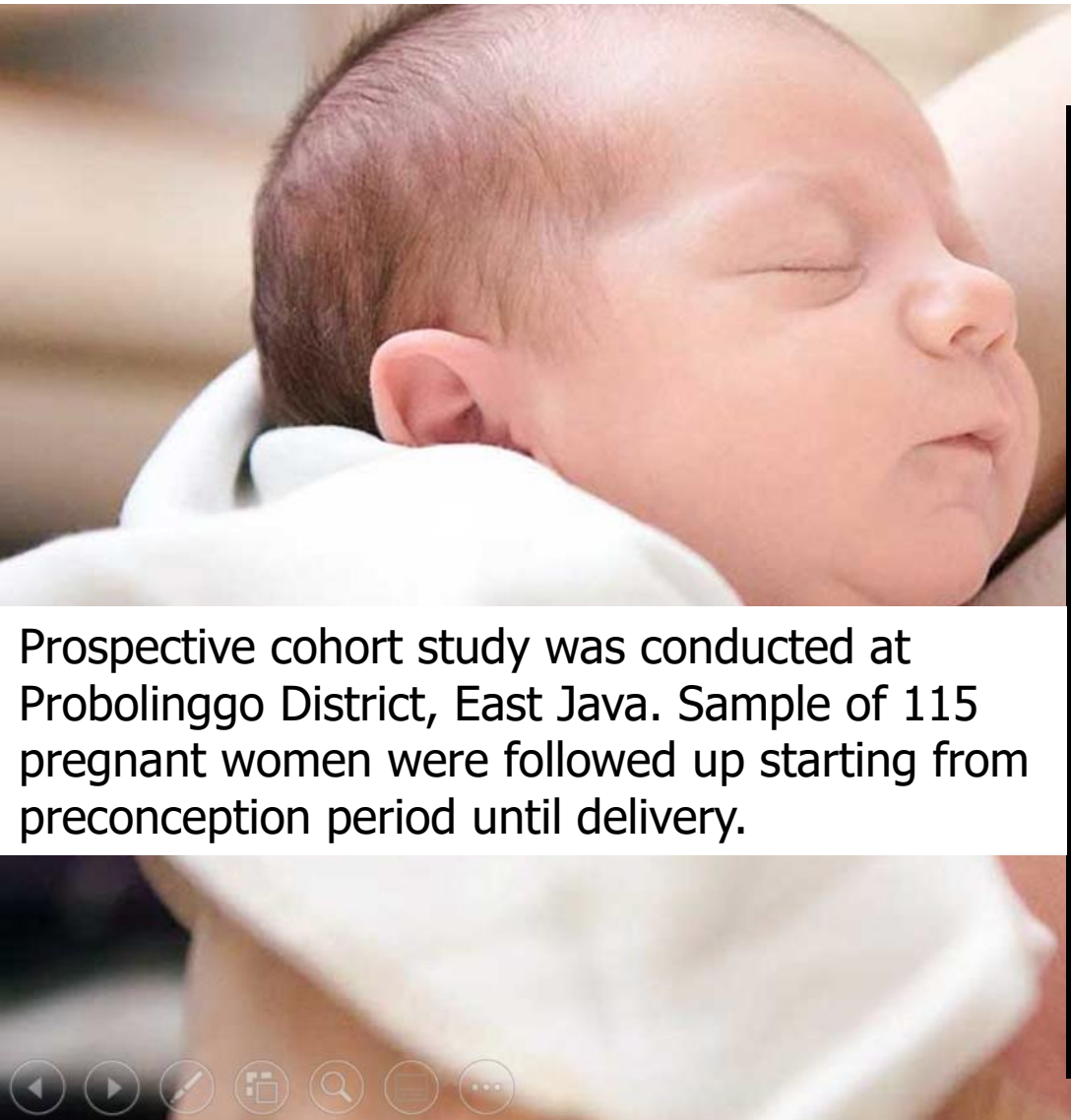


The average length of infant born to pregnant women in MMN group was longer, 49,5 cm vs 47,8 cm with value (p=0,001)

Birth length	IFA group supplementation (n=7)			MMN group supplementation (n=12)		
	Mean ± SD	Median	Min± Max	Mean ± SD	Median	Min± Max
	47,86 cm ± 2,41	48 cm	50 cm ± 43 cm	49,5 cm ± 2,54	49 cm	55 cm ± 46 cm
Birth length difference between IFA and MMN group						
Difference	1,64 cm					
95% CI	47,66 – 50,13					
P value	0,001					

Status Of Micronutrients and Maternal Fetal Endocrine During Pregnancy and Its Correlation To Neonatal Birth Size : Prospective Cohort Study From Preconception

Sri Sumarmi, Soenarnatalina, Melaniani, Bambang Wirjatmadi, Kuntoro, Erry G Dachlan, Retno Handajani



Prospective cohort study was conducted at Probolinggo District, East Java. Sample of 115 pregnant women were followed up starting from preconception period until delivery.

Results :

Birth weight significantly correlated with

- Preconception body weight ($r=0.33$; $p=0,004$)
- BMI ($r=0.235$; $p=0.033$)
- Stature ($r=0.237$; $p=0.013$)
- Hemoglobin level at week-35 ($r= 0.255$; $p=0.011$)
- Serum retinol week-35 ($r=0.236$; $p=0.032$)
- Concentration of serum hPL ($r=0.262$; $p=0.018$)
- Fetal IGF-1 ($r=0.286$; $p=0.022$)
- Length of birth correlated with serum retinol ($r=0.245$; $p=0.029$)
- hPL concentration ($r=0.049$; $p=0.001$)

Conclusion

Pre-conceptual body size is more important parameter for neonatal birth size than during pregnancy, meanwhile micronutrients status at last pregnancy more significant parameter for birth size than before or early pregnancy.

Micronutrients Supplementation During Preconception Period Improves Fetal Survival and Cord Blood Insulin Like Growth Factor-1

Sri Sumarmi, B Wirjatmadi, Kuntoro, E Gumilar, E.Retnowati



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Micronutrients Supplementation during Preconception Period Improves Fetal Survival and Cord Blood Insulin-Like Growth Factor I

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Table 4: Distribution of fetal survival and fetal age within multi-micronutrients and Placebo-IFA group

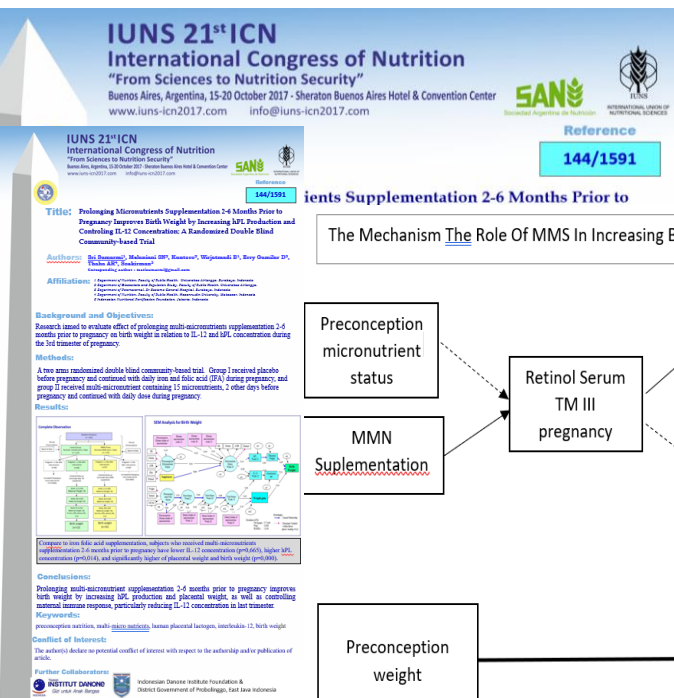
Gestation age	MMN group (n = 57)		Placebo-IFA group (n = 55)		Total (n = 112)	
	No.	%	No.	%	No.	%
Fetal survival*						
Survival (≥37 weeks)	56	98.2	45	81.8	101	90.2
Not survive (<37 weeks)	1	1.8	10	18.2	11	9.8
Fetal age						
Miscarriage (<28 week)	1	1.8	4	7.4	5	4.5
Early preterm (28-35 weeks)	0	0.0	4	7.4	4	3.6
Late preterm (35-37 weeks)	2	3.5	2	3.7	4	3.6
At term (>37 weeks)	54	94.7	45	81.5	99	88.4

*Chi-square test: Contingency coefficient: 0.266, p = 0.003 (OR: 6.099, 95% CI: 0.934-39.847), MMN: Multi-micronutrients, BMI: Body mass index, MUAC: Mid upper arms circumference

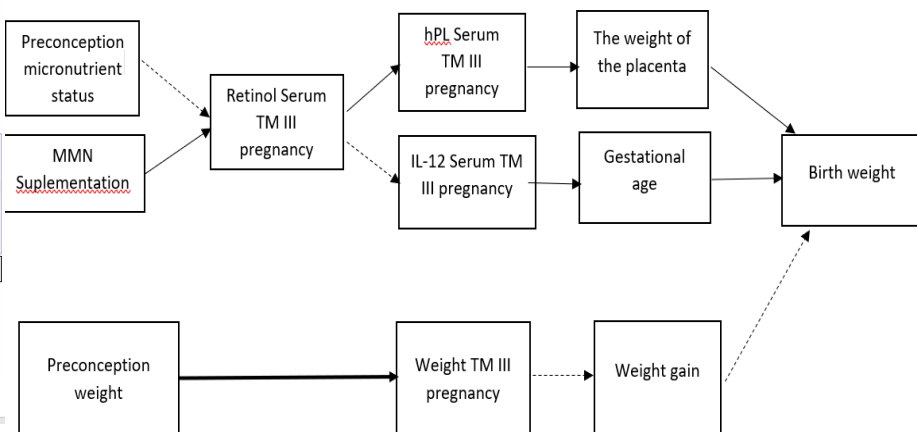
- Fetal survival is defined as the ability of fetus to survive in uterine until delivery in complete gestation period or at term delivery (birth >37 weeks).
1. Several micronutrients play important role in synthesis of IGF-1.
 2. Fetal survival rate in MMN group was significantly higher than those in Placebo-IFA group.
 3. MMN supplementation prior to pregnancy also tends to increase umbilical cord serum IGF-1.

Mechanism Of Effect Of Preconceptional Multi-micronutrients Supplementation On Birth Weight And Fetal Viability Related To Interleukin 12 And Human Placental Lactogen

Sri Sumarmi, B Wirjatmadi, Kuntoro, E Gumilar, E.Retnowati



The Mechanism The Role Of MMS In Increasing Birth Weight Is Simply Described In Following Figure



1. Energy and protein intake predominantly affect birth weight beginning at preconception period until weeks 35th, and total weight gain does not affect birth weight. Micronutrients intake consistently affects birth weight beginning at preconception period, although in preconception period its effect is lower than energy effect. While energy effect decreases in the last trimester, micronutrients' effect increases dominantly through the increasing of hPL concentration and placental weight, accompanied with the decreasing of IL-12 concentration in weeks-35. The dominant effect of placental weight and hPL concentration are mediated by serum retinol.
2. Preconception MMS modifies the effect of total weight gain **beginning at weeks-28 until weeks-35**. This modification would cause the increasing of weight gain rate in last trimester and improve subcutaneous fat deposition.
3. **Fetal viability is directly and dominantly affected by gestational age.** Micronutrients form dietary intake and supplementation tend to affect gestational age depending on duration of intervention during preconception period.
4. Concentration of IL-12 most likely affects preterm birth. Therefore **IL-12 may play an important role as an early indicator for prematurity.** Multi-micronutrients supplementation during preconception period, at least 3 month prior to pregnancy, may prevent miscarriage and prematurity.

Notes:

: There is a Causal Relationship (bold lines indicate the dominant cause)

: No Causal Relationship

The Mechanism



Planning For Pregnancy

3 Jangan

Jangan Hamil kalau tidak terencana

Jangan terlantarkan kehamilan anda

Jangan bikin anak hanya tersia-sia

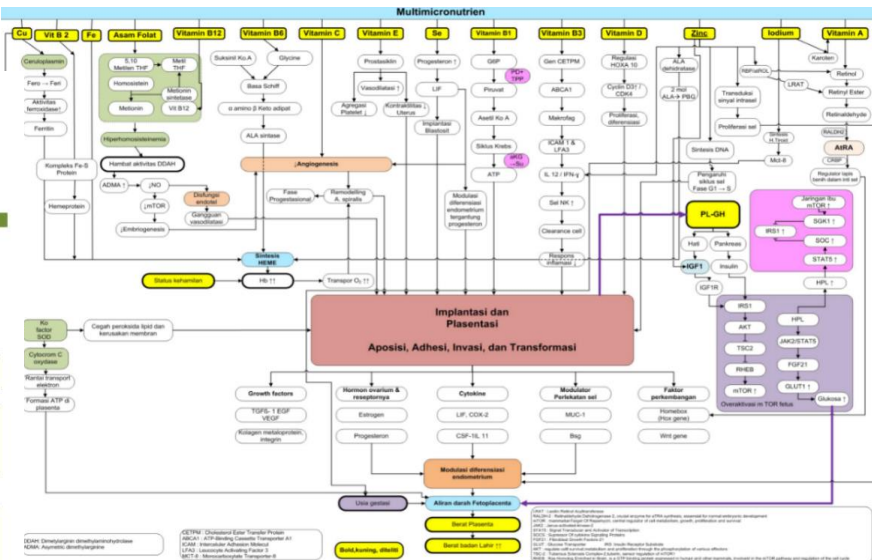
6 TERLALU

Terlalu Muda Terlalu Tua

Terlalu Sering Terlalu Banyak

Terlalu Kurus Terlalu Gemuk

Sumber : BKKBN, 2020, Modifikasi Lucy



Sys Rev Pharm 2020;11(8):550-553
A multifaceted review journal in the field of pharmacy

The Role of Multimicronutrients on Improving Better Pregnancy Outcomes: A literature review

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ABSTRACT

This paper describes the role of multimicronutrients on improving better pregnancy outcomes. Multimicronutrients are vitamins and minerals needed for normal body function, growth and development. There are 6 vitamins and minerals involved in heme synthesis, namely Cu, vitamin B2, folic acid, vitamin B12, Fe and vitamin B6 which are the main components in the formation of red blood cells and ensure the availability of oxygenation supply in the tissues. There are 6 vitamins and minerals involved in implantation and placentation,

Keywords: Role, multimicronutrient, pregnancy outcome

Correspondence:

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***Corresponding author:** Lucy Widasari, 0812-19533645 E-

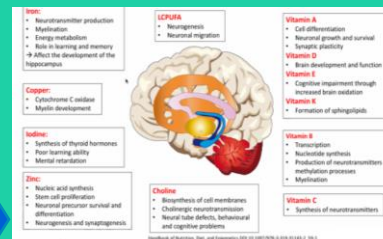
The importance of MATERNAL nutrition



Organ	Micronutrient	
	Minerals	Vitamins
Liver	Fe, Se, Cu, Zn, Cd	A, B12, choline, folic acid
Heart	Cu, Zn	A, D
Kidney	Fe, Cd, Zn, Pb	A
Brain	Fe, Cu, Zn, I	A, B6, B12, folic acid, biotin
Lung	Cu, Zn, Cd	
Bone	Ca, Mg	D, E, C

Reproduction (2001), 122, 527-535

Brain Formation

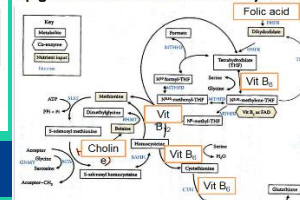


Implantation & Placentation



DNA & Histon Methylation

Epigenetics: DNA & Histone Methylation



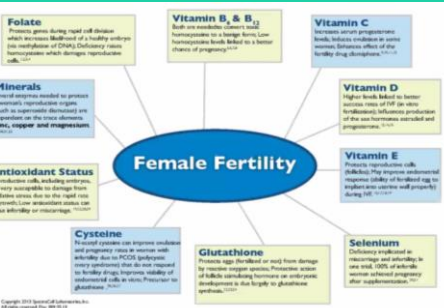
Heme Synthesis



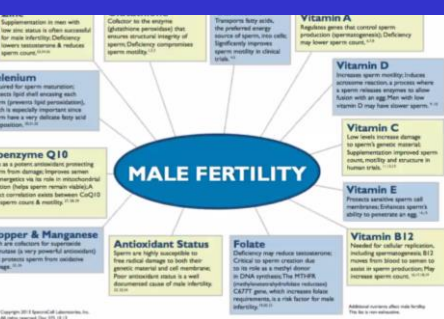
M-TOR activation



The importance of PRECONCEPTION nutrition

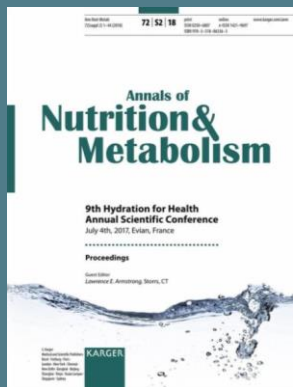


The importance of PRECONCEPTION nutrition



Multisectoral Action to Improve Nutrition in Banggai District, Indonesia

Herwin Yatim, Anang S Otoluwa, Ramli Tongko, Abdul Razak Thaha



Annals of Nutrition and Metabolism Vol. 72, Suppl.2, 2018

Background : Implementation of the Scaling Up Nutrition program requires strong commitment from local leaders and multisectoral action. The objectives were to show evidence of how a multisectoral approach was implemented and to determine whether this approach affected indicators related to the nutrition-sensitive intervention.

Methodology : We interviewed and collected data from the key informants at the departments and organizations serving as stakeholders for the multisectoral approach, such as the district irrigation, social, health, family planning, planning and development, agriculture and horticulture, and food security offices. We analyzed the data by examining the results after both the first year (2015) and the second year (2016) of implementation. Multisectoral action was started in the beginning of 2015. All stakeholders received information about the importance of nutrition in the first 1,000 days of life and the role of multisectoral approach from seminars, discussions, posters, and leaflets.

Results : Two regulations were produced, and a task force was established to coordinate implementation. After two years, we found that clean water coverage increased, from 81.8% in 2015 to 83.4% in 2016; that the percentage of households using latrines increased from 66.8% to 71.8%; that the median age for the first marriage for women has increased from 21 to 25; that the percentage of women using contraception increased from 62% to 65%; that the percentage of poor people with insurance increased from 39% to 51%; and that the percentage of poor people decreased from 9.84% to 9.48%.

Conclusion : Commitment from local leaders has been earned, and indicators related to the nutrition-sensitive intervention have shown increases. However, analysis of nutrition-specific indicators is needed.

Keywords : Multisector, nutrition, nutrition-sensitive intervention

BUPATI BANGGAI HERWIN YATIM

TEKAN KEMATIAN IBU & STUNTING MELALUI POSYANDU PRAKONSEPSI



Head of Banggai District received government reward regarding their innovative actions to reduce stunting, maternal mortality rate, Low birth weight through implementation of preconception posyandu programs

Kemungkinan. Khusus untuk bidang kesehatan inovatif Posyandu Wanita Prakonsepsti telah diakui dunia. "Kami pun diundang oleh kongres gizi internasional di Argentina pada Oktober ini," katanya.

Dia memaparkan, Posyandu Wanita Prakonsepsti adalah pelayanan yang diperuntukkan bagi wanita praahamil. Program ini dilaksanakan pada Maret 2015 dimulai dengan sosialisasi melalui seminar Peringatan 1.000 Hari Pertama Kehidupan (HPK), sosialisasi ke stakeholders tingkat kecamatan dan

... pada 2016 dan rencana tahun 2017 dari 46% menjadi 18%.

Kegiatan posyandu prakonsepsi berbasis desa. Namun agar pelaksanaannya mendapatkan dukungan, maka dilakukan kegiatan terstruktur mulai dari tingkat kabupaten, kecamatan, dan desa. Untuk memulai kegiatan, maka posyandu prakonsepsi diuji coba di Desa Padang. Desa terpilih karena sarana tersedia lengkap, partisipasi masyarakat tinggi, serta bidan

... pada 2016 dan rencana tahun 2017 dari 46% menjadi 18%.

Kegiatan posyandu prakonsepsi terinspirasi dari hasil studi mahasiswa program doktor (Anang S Otolova) di Universitas Hasanuddin Makassar dengan judul *Pengaruh Pemberian Multi Gizi pada Periode Perkonsepsi Terhadap Pencegahan Kematian DNA*. Secara bertahap, setelah mendapatkan pendidikan, Anang diangkat menjadi Kepala Dinas Kesehatan Kabupaten Banggai. Dia kemudian mengimplementasikan penelitiannya.

Selanjutnya pihak Unhas dan Pemkab Banggai melakukan kerja sama untuk memberi dukungan ilmiah melalui studi longitudinal penyelamatan 1.000 Hari Pertama Kehidupan. Mahasiswa S2 dan S3 dari Universitas Hasanuddin (Unhas) Makassar serta Universitas Airlangga (Unair) Surabaya saat ini tengah melakukan penelitian untuk memperkuat bukti ilmiah pelaksanaan kegiatan ini.

Mencegah Stunting
Posyandu prakonsepsi adalah rangkaian dari program penyelamatan 1000 Hari Pertama Kehi-

... pada 2016 dan rencana tahun 2017 dari 46% menjadi 18%.

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Mencegah Stunting
Posyandu prakonsepsi adalah rangkaian dari program penyelamatan 1000 Hari Pertama Kehi-

Reducing Maternal Mortality and Stunting Through Preconception Posyandu

Banggai at night : the most exotic and hidden paradise

Recommendation letter from Head of Banggai District to the Researchers

Suscatin and Integrated post for preconception women in Banggai District has become an innovative intervention to increase the health literacy status of Preconception women, prevention and treatment of anemia and monitoring of pregnancy complication, including preeclampsia, and help reduce MMR.

Need strong commitment, integrated multisectoral stakeholder-networking and comprehensive approaches and interventions to improve the health of preconception women.

BUPATI BANGGAI
SURAT KETERANGAN
Nomor : 442 / 3 / 81 / Dinkes

Disusun ini menerangkan bahwa :

Nama : 1. Dr. Lucy Widarti, MS
2. Rahayu Yekti, MSN

Pelaksanaan : Peneliti Program Posyandu Prakonsepsti di Dinas Kesehatan Sub. Banggai

Memberikan rekomendasi Kepada Peneliti tersebut diatas untuk membawa sampel darah melalui urine yang akan digunakan untuk penelitian pada program Posyandu Prakonsepsti di Kabupaten Banggai dari Luvak Banggai (Subsistem Tengah) ke Surabaya (Jawa Timur) untuk dilakukan pemeriksaan laboratorium secara spesifik di RSUD Dr. Soetomo.

Penelitian pada program Posyandu Prakonsepsti merupakan program implementasi yang fokus perbaikan gizi pada 1000 hari pertama kehidupan (1000 HPK) yaitu sejak hari pertama kehamilan sampai anak usia dua tahun yang merupakan upaya inovatif Kabupaten Banggai untuk menurunkan angka kematian ibu dan prevalensi stunting (balita pendek).

Sampel tersebut berupa :

1. Serum (dalam cup serum) dan darah (dalam vacuum tube) ibu hamil
2. Spermatik sampel :
 - a. Serum darah : tidak berbau, berwarna kuning bening, tidak memicu api/kebakaran, tidak menimbulkan ledakan, tidak mempunyai nilai ekonomis, tidak menimbulkan penyakit
 - b. Darah : tidak berbau, berwarna merah, tidak memicu api/kebakaran, tidak menimbulkan ledakan, tidak mempunyai nilai ekonomis, tidak menimbulkan penyakit

Demikian surat keterangan ini dibuat agar dapat dipergunakan sebagaimana mestinya.

BUPATI BANGGAI
HERWIN YATIM, MM

ALUR PELAYANAN TERPADU WANITA PRAKONSEPSI UNTUK PENINGKATAN STATUS GIZI DENGAN PENDEKATAN PELAYANAN GIZI DAN KESEHATAN IBU ANAK SECARA BERKESINAMBUNGAN KECAMATAN - KUA - PUSKESMAS-PKK DI KABUPATEN BANGGAI


Tim Percepatan Perbaikan Gizi 1000
2016

DAFTAR KELOMPOK
Berdasarkan Jenis Pengantar


- 1. Kelompok 1: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko tinggi.
- 2. Kelompok 2: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko rendah.
- 3. Kelompok 3: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat rendah.
- 4. Kelompok 4: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat tinggi.
- 5. Kelompok 5: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat rendah.
- 6. Kelompok 6: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat tinggi.
- 7. Kelompok 7: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat rendah.
- 8. Kelompok 8: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat tinggi.
- 9. Kelompok 9: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat rendah.
- 10. Kelompok 10: Perempuan 15-44 tahun, hamil 1-4 trimester, risiko sangat tinggi.

Sebagai sebuah inovasi, implementasinya membutuhkan kerja keras. Perlu komitmen kuat dari pemerintah kabupaten, dukungan dari lintas sektor, Camat, kepala puskesmas, KIA, kepala desa, dan tenaga kesehatan di desa dan tim anggotanya penggerak PKK.

Conclusions and Recommendations (1)

- 
1. **Preconception care has a positive impact on maternal and child health outcomes** : the mother to-be are able to get early identification of pregnancy risk factors such as anemia before pregnancy, identifying and managing maternal conditions and behaviors during pregnancy which may pose a risk to both mother and newborn.
 2. **MMS given from preconception has a better effect than IFAS on**
 - **Pregnancy status**, including: Increase in body weight during pregnancy and increase in MUAC
 - **pregnancy outcomes**, including: placental weight, birth weight and birth length
 - The administration of selenium in MMN preparations since the preconception period has a better effect in reducing MDA levels compared to the IFA group.
 - MMS during preconception period, at least 3 month prior to pregnancy, may prevent miscarriage and prematurity.
 - Several micronutrients play important role in synthesis of IGF-1.

Conclusions and Recommendations (2)

- 
3. Antioxidants are very important to prevent pregnancy complications associated with oxidative stress, therefore MMS since preconception is important to improve the antioxidant status of pregnant women
 4. Good health and nutrition before conception are key to a mother's ability to meet the nutrient demands of pregnancy and breastfeeding, and are vital to the healthy development of her embryo, fetus, infant, and child.
 5. More importantly, it should sensitise the government with various evidence-based studies to prioritise the nutritional and health needs of preconception women **lead to new and innovative suggestions to improve the present situation.** Investing in adolescent, preconception, and maternal nutrition will provide a range of cumulative benefits, delivering improvements in health across multiple sectors of society.

Preconception Research Recommendation



1. MMN should be given **since preconception** and to all women of childbearing age
2. Depending on the specific nutrient and its role in placental and fetal development, waiting until pregnancy may be too late to have a beneficial impact on the course of the pregnancy and its outcome
3. The **education based on local context** of women of childbearing age on the importance of adequate nutrition for the improvement of pregnancy outcomes should be a priority.
4. Continuing efficacy studies that have shown positive results with effectiveness studies as evidence for policy making.
5. It is now essential analyze some new scientific insights are translated into messages about the importance of a healthy lifestyle for healthy offspring, applicable to both adolescent girls and women.



Academics can play a central role in

1

EDUCATION

1. Integration lessons related the importance preconception period at relevant study programs and evidence based learning from the field
2. Develop knowledge and technology, new concepts and theories for promoting preconception healthcare

2

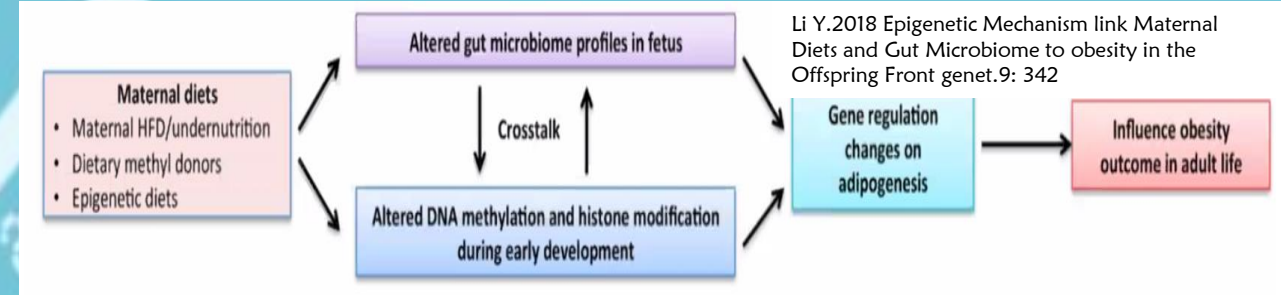
RESEARCH

Provide evidence specifically related to improving preconception services for women of reproductive age to assist with planning and preparation for healthy pregnancies, emphasizing the importance of healthy nutrition through scientific research

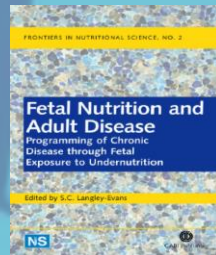
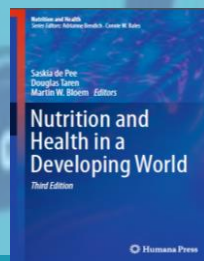
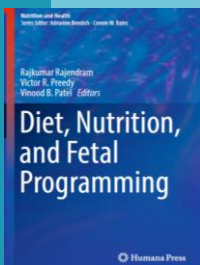
3

COMMUNITY DEDICATION

1. Thematic practices for assisting the community : play on posyandu repositioning program : Focus on rescue the first 1000 days of life since preconception
2. The development of fostered areas that are focused and sustainable
3. Coordination with regional governments in initiate and ensuring the sustainability of development policies



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2. **Abdul Farid Lewa, Venny Hadju, Sudirman Nasir, Ridwan Aminuddin.** The Effect Of Multimicronutrient Provision And Application-based Nutrition Education To Mothers On The Growth and Development Of Babies 0-6 Months
3. **Erni Yusnita Lalusu.** Effect of MMN since Preconception on Blood Glucose Levels During Pregnancy in Banggai Regency
4. **Dewi Pramoni, Ikeu Tanziha, Dodik Briawan, Ali Khomsan.** The Effectiveness Of The Combination Of Nutrition Education And Nutritional Supplementation For Prospective Brides To Prevent The Incidence Of Stunting In Newborns
5. **Rahayu Nurul Reski, Venny Hadju, Rahayu Indriasari, Masyita Muis.** The Effect Of Moringa Leaf Extract In Preconception Women On Birth Weight and Birth Length Of The Baby





THANK YOU



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Kolom ini diusah oleh
Dr. dr. Lucy Widasari, M.Si



Penting bagi pasangan calon suami istri melakukan PERSIAPAN SEBELUM terjadi KEHAMILAN agar sel telur/perma dan rahim sehat. Embrio yang baik akan tercipta selanjutnya akan menempel pada rahim dan terjadi kehamilan sehat, yang akan MENURUNKAN salah satu risiko STUNTING

SEKILAS TENTANG DOKTER
Dokter Lucy Widasari, M.Si adalah dokter spesialis Obstetri dan Ginekologi di RSUD Selayar. Beliau telah bekerja selama 15 tahun di RSUD Selayar. Beliau memiliki pengalaman yang luas dalam menangani berbagai kasus Obstetri dan Ginekologi. Beliau juga aktif dalam kegiatan sosial dan pendidikan kesehatan masyarakat.

Negara Maju Bebas Stunting

10 PENTING UNTUK IBU

CEGAH STUNTING SEJAK MASA PRAKONSEPSI

APA PERUBAHAN?

Stunting adalah kondisi pertumbuhan fisik yang terhambat, terutama pada anak-anak di bawah usia 5 tahun. Stunting dapat disebabkan oleh berbagai faktor, termasuk gizi buruk, infeksi, dan faktor genetik. Stunting dapat berdampak buruk pada kesehatan anak, termasuk risiko penyakit kronis, gangguan kekebalan tubuh, dan gangguan kecerdasan.

PERUBAHAN PERILAKU DAN KEBERHASILAN

Untuk mencegah stunting sejak masa prakonsepsi, ibu hamil perlu melakukan beberapa perubahan perilaku, termasuk:

- 1. Melakukan pemeriksaan kesehatan rutin sebelum hamil.
- 2. Mengonsumsi makanan bergizi seimbang.
- 3. Menghindari konsumsi alkohol dan narkoba.
- 4. Menghindari stres berlebihan.
- 5. Menghindari paparan zat beracun.
- 6. Menghindari paparan polusi.
- 7. Menghindari paparan infeksi.
- 8. Menghindari paparan penyakit menular.
- 9. Menghindari paparan penyakit kronis.
- 10. Menghindari paparan penyakit autoimun.

PERSIAPAN MASA DEPAN

Setelah melahirkan, ibu hamil perlu melakukan beberapa persiapan untuk masa depan, termasuk:

- 1. Melakukan pemeriksaan kesehatan rutin untuk anak.
- 2. Mengonsumsi makanan bergizi seimbang untuk anak.
- 3. Menghindari konsumsi alkohol dan narkoba untuk anak.
- 4. Menghindari stres berlebihan untuk anak.
- 5. Menghindari paparan zat beracun untuk anak.
- 6. Menghindari paparan polusi untuk anak.
- 7. Menghindari paparan infeksi untuk anak.
- 8. Menghindari paparan penyakit menular untuk anak.
- 9. Menghindari paparan penyakit kronis untuk anak.
- 10. Menghindari paparan penyakit autoimun untuk anak.