


Towards Reducing the High Percentage of Iron Deficiency Anemia in Pregnant Mothers in Klinik Kesihatan Sungai Acheh, Penang

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Overview of QA Project

Group Members

- Dr Khaw Chwin Khai - FMS (Team Leader)
- Dr Nithiyia Raja - MO
- Dr Asilah Abdul Rahman-MO
- Mastura Binti Mat Isa- Nurse
- Thanaeswari -Nurse
- Hafizan Md Ishak - MA
- Puan Izzati - Nutritionist
- Puan Farah - Pharmacist

Location

- Klinik Kesihatan Sungai Acheh

Rural health clinic in Mukim 10, Seberang Perai Selatan, Penang

Demographic of mostly farmers and fishermen

QA Study

- Duration : 18 months (Sept 2022 – March 2024)
- Cycles

1 Remedial Cycle

3 Remedial Cycles

- Reevaluation cycle

(May - Aug 2024)

Selection of Opportunities for Improvement- Problem Identification

List Of Problems in Klinik Kesihatan Sungai Acheh

- 1. Poor compliance and patient knowledge regarding asthma treatment among Bronchial Asthma patients in KK Sg Acheh.
- 2. Poor acceptance of Long Acting Contraceptive Device among high risk women.
- 3. Lack of awareness among women age 30-65 about importance of Pap Smear
- 4. High percentage of IDA in pregnancy by 36 weeks in pregnant patients in KK Sg Acheh
- 5. Refusal / Poor acceptance of insulin injectables among DM patients with HbA1c >10.

Problem Prioritization- S.M.A.R.T – Nominal Group Technique

No	PROBLEMS	S	M	A	R	T	TOTAL
1.	**Poor compliance and patient knowledge regarding asthma treatment among Bronchial Asthma patients in KK Sg Acheh.**	1+1+2+ 2+1+1+ 1+1	2+1+1+ 1+1+1+ 1+2	2+2+1+ 2+1+2+ 1+1	1+1+1+ 1+1+1+ 1+2	2+1+1+1 +1+1+1+ 1	49
2.	**Poor acceptance of Long Acting Contraceptive Device among high risk women.**	2+2+1+ 1+3+1+ 1+2	2+1+1+ 1+1+1+ 1+1	2+1+1+ 1+1+1+ 1+1	1+1+2+ 2+1+1+ 1+1	2+1+2+1 +1+1+2+ 1	52
3.	**Lack of awareness among women age 30-65 on importance of Pap Smear**	3+2+1+ 1+2+2+ 2+1	2+2+1+ 1+3+1+ 1+2	2+1+1+ 1+1+1+ 1+1	2+1+1+ 1+1+1+ 1+2	3+2+2+1 +1+2+1	58
4.	***High percentage of IDA in pregnancy at 36 weeks POA in pregnant mothers***	***3+3+3 +2+2+ 2+3+3***	***2+2+3 +3+3+ 3+3+3***	***2+3+2 +3+3+ 3+2+3***	***3+3+2 +3+2+ 3+3+3***	***3+3+3+ 3+2+1+ 3+3***	**107**
5.	**Refusal / Poor acceptance of insulin injectables among DM patients with HbA1c >10**	2+1+1+ 1+1+1+ 1+3	3+2+1+ 1+2+2+ 2+1	2+3+3+ 3+1+1+ 1+2	1+1+2+ 2+1+1+ 1+1	2+1+1+1 +1+1+1+ 2	62

Problem Prioritization : Why did we choose this study? S.M.A.R.T

SERIOUSNESS	**Iron Deficiency Anemia can lead to *poor outcomes for both mother and baby*** ***Maternal Complications*** Increased risk of *postpartum hemorrhage, maternal sepsis and maternal shock* *- M.Nair et al ., 2016* ***Fetal Complications*** *Intrauterine growth restriction and perinatal death in newborns* *Developmental difficulties in childhood* *- NM Abu-Ouf et al ., 2015*
MEASURABLE	Data regarding patients IDA status and management of pregnant patient with IDA can be ***readily extracted*** from patient antenatal records and antenatal registry census.
APPROPRIATE	KKSA had the ***highest percentage of IDA in Penang state*** in **2021 at 14.7%**
REMEDIABLE	***There is an opportunity to undertake remedial strategies by :*** - focusing on patient and community awareness on IDA - compliance to haematenics - improving staff knowledge and training on Management of IDA.
TIMELINESS	The study can be completed within a ***reasonable*** time frame

Definitions, Terms and Abbreviations

Iron Deficiency Anemia (IDA)	**Haemoglobin of <11 mg/dL and serum ferritin <30 ng/mL**
Severe IDA	**Haemoglobin of < 7.0 mg/dL and/ or symptomatic IDA**
Pregnant mothers at 36 weeks	**Number of pregnant mothers registered in the census KIB_201B at 36 weeks POA**
Period of Amenorrhea (POA)	**Period of time lapsed from first day of last menstrual period**
High Risk Mothers	**-Previous Anemia -Short Pregnancy Interval < 1 year -Vegetarians -Recent episode of bleeding - Multiple Pregnancy - Previous Hx of PPH - Placenta Previa - Teenage Pregnancy**
Haematenic	**A substance containing elemental iron that increases the amount of haemoglobin in the blood. This includes Ferrous Fumarate, Maltofer, Zincofer and Iberet**
Parenteral Iron	**Iron administered through intravenous method. Ex: Venofer, Cosmofer etc**

Perinatal Care Manual MOH 4th Edition June 2022

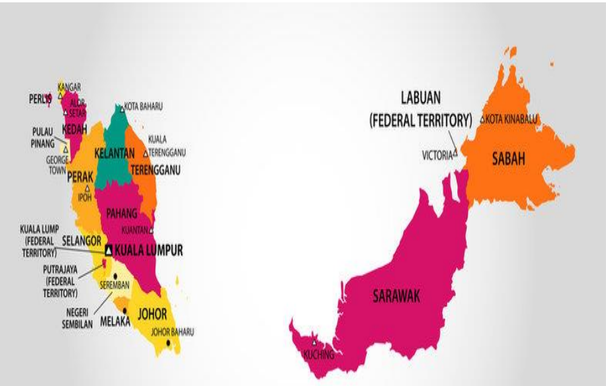
Introduction

Prevention of Iron Deficiency Anemia (IDA) in pregnancy is important for optimal pregnancy outcome, maternal wellbeing and fetal development.

IDA status worldwide* : The prevalence of IDA in low and middle income countries is up to *50%.

***IDA status in Malaysia* :**

Prevalence of Anemia in pregnancy (WHO)	Category of Public Health Burden
≤ 4.9	No public Health Problem
5.0-19.9	Mild Public Health Problem
20.0-39.9	**Moderate Public Health Problem**
≥ 40.0	Severe Public Health Problem



Iron deficiency anemia is the *most common cause* of anemia in pregnancy in Malaysia, with prevalence of IDA in Malaysia of up to ***31.6-34.6%.*** - Abd Rahman R et al ., 2022

Addressing the problem over the years :

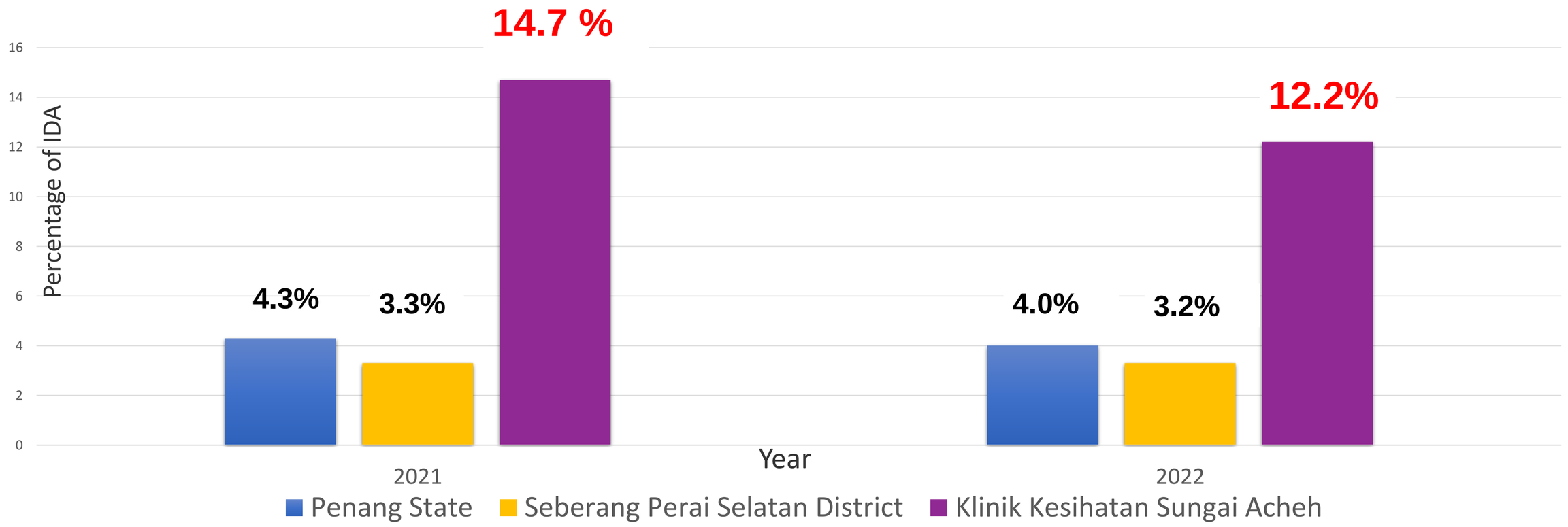
Prevalence of anemia : ***35.0% in 2007*** Haniff et al,. 2007 → ***33.2% in 2018*** by Rohim et al., 2022

Despite supplementation of oral iron and multiple measures, the prevalence only reduced by a mere 1.8% in 11 years - *NOT an easy problem to tackle!!*

Verification of Problem

In 2021/2022, the percentage of Iron Deficiency Anemia (IDA) among pregnant mothers in KKSA was at **14.7%** and **12.2%,** which is *far higher than the average in the state of Penang and SPS district*

> 3x the state percentage!

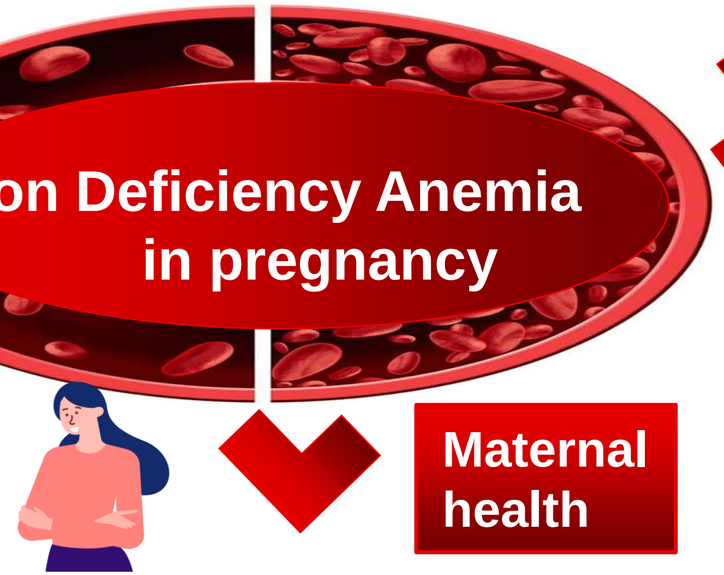


Comparing percentage of IDA in Pregnant Mothers at 36 weeks POA between Penang State, Seberang Perai Selatan District and KK Sungai Acheh 2021/2022

Literature Review – Complications of IDA in pregnancy

Pregnancy Outcome

- **2X** Risk of Preterm Delivery
- **3X** Risk Low Birthweight Baby
- Risk of intrauterine death



Infant Health

- Neonatal Iron Deficiency
- Increased Risk of Intellectual Disabilities

A. E. Benson .et al., 2022. European Journal of Haematology

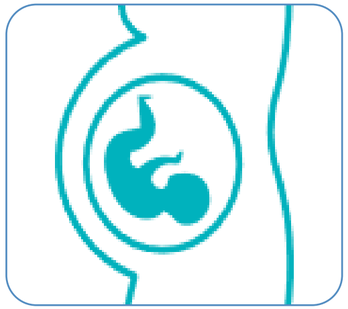
Increased Risk of

- Severe post partum haemorrhage
- Maternal sepsis
- Post partum depression
- Maternal Shock
- Maternal Death

Reducing the percentage of anemia in pregnancy by ***1 g%*** *reduces the risk of maternal death by* ***29%.***

CHERG Iron Report: Maternal Mortality Child Mortality Perinatal Mortality Child Cognition and Estimates of Prevalence of Anemia due to Iron Deficiency

Literature Review – Factors contributing to high percentage of IDA



What are the risk factors for iron deficiency anemia in pregnancy?

- Low family income
- Late booking
- Non compliance to haematenic
- Teenage Pregnancy

Abd Rahman R et al ., 2022

What are the reasons for non compliance to haematenic?

- Poor awareness regarding IDA
- Forgetfulness
- Side effects of haematenic
- Fear of large fetus

Nurulhuda Abd Kadir. 2021. Knowledge of Oral Iron Consumption among Pregnant Women at Hospital Universiti Sains Malaysia Mal J Med Health Sci 17(SUPP9): 109-117,

Other possible factors contributing to high percentage of IDA

- Ineffectiveness of health education on IDA
- Lack of knowledge and appropriate attitude toward maternal anemia among health care providers

Hasneezah Hassan. 2019. A Systm Review on Methods Used in Health Education Intervention on Anaemia in Pregnancy Mal J Med Health Sci 15(SP3): 77-83
Lusine Mirzoyan .1999.Iron-Deficiency Anemia in Pregnancy: Assessment of Knowledge, Attitudes and Practices of Pregnant Women in Yerevan

Problem Statement

Problem

High percentage of IDA in pregnancy at 36 weeks in Sg Acheh

Verification Study : **14.7%** (2021)
- *Highest in Penang State!*

Possible Causes

Ineffective Counselling

Inadequate Management of IDA

Poor Compliance to Haematenics

Effects

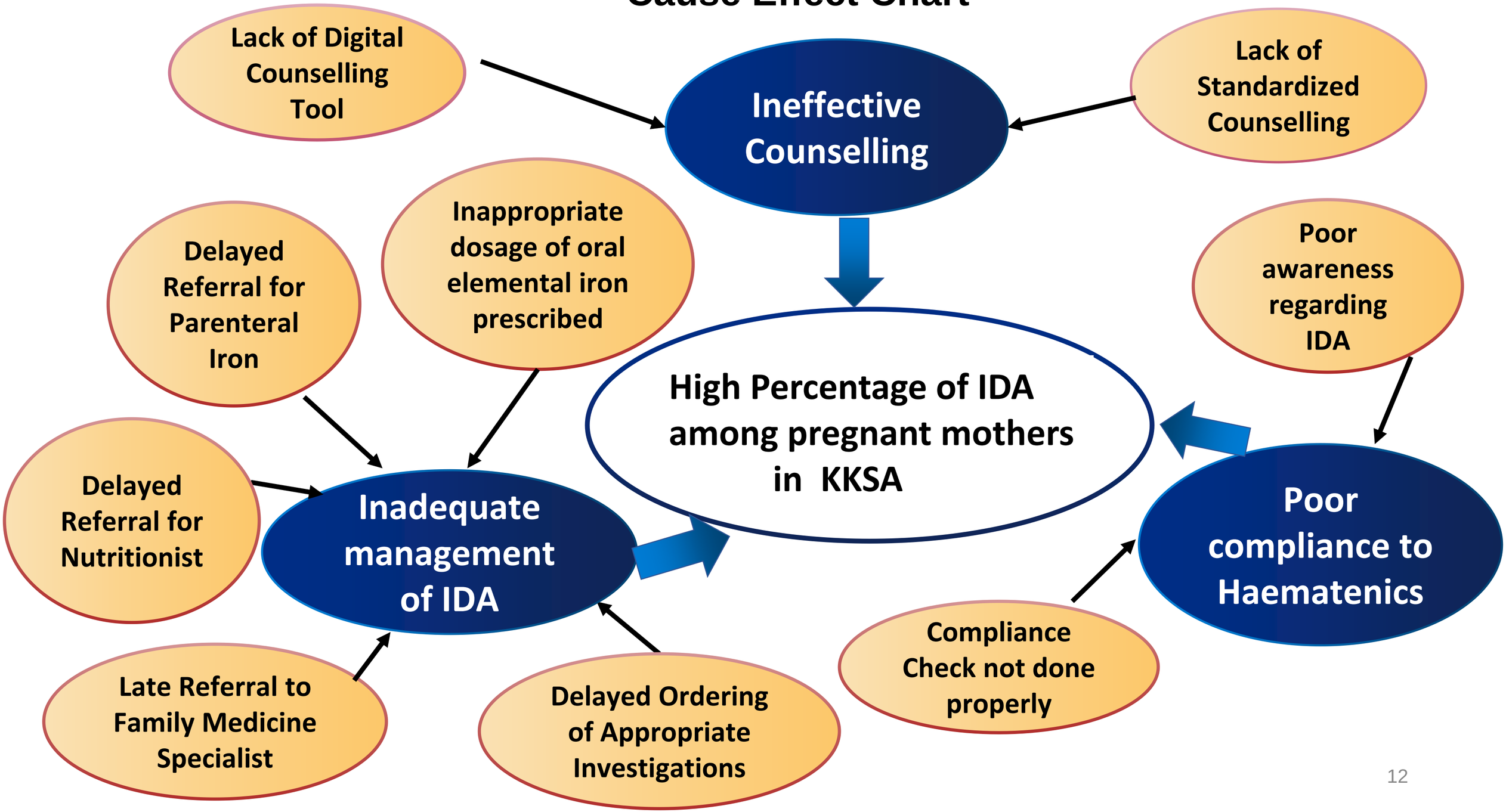
Mother:
Maternal Shock
PPH
Blood transfusion

Baby :
Preterm Delivery
Intrauterine Death
Intellectual Disabilities

Aim of study

We hope to reduce the high percentage of iron deficiency anemia among pregnant women at 36 weeks POA in KK Sg Acheh

Cause Effect Chart



Process of Care

In 2022, there ***was no dedicated workflow process*** for IDA or anemia in health clinics in Penang state

Booking Registration of Antenatal Patient and review of booking full blood count

MCH Nurses

Standardized IDA Counselling given to all antenatal patients

Hb <11

IDA

NO

Investigation of other causes of anemia

YES

- MCH Nurses
- Medical Officer
- Family Medicine Specialist
- Nutritionist

Management of patient according to Inhouse IDA Management Protocol

To review Hb in 2 weeks

- MCH Nurses
- Medical Officer
- Pharmacist

Compliance Check and Optimization of Haematenics

Hb <11

Hb optimized

Model of Good Care (MOGC)

No	Process	Criteria	Standard
1.	Standardized IDA Counselling	QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis	100%
		IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	100%
2.	IDA Management Protocol	Medical Officer to order appropriate investigations for IDA- Suspected IDA Hb <11 with Microcytic Hypochromic Picture *Serum Feritin/ Iron Studies* Suspected Other Causes- *Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout*	100%
		To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	100%
		To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	80%
		Appropriate Referral for Parenteral Iron	100%
		Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	80%
3.	3.Compliance Check and Optimization of Haematenics	Compliance check and optimization of Haematenics	100%
		Assessment of patient awareness of IDA in pregnancy *- Able to correctly answer at least 3 out of 4 components (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics*	80%

Key Measures for Improvement- Study Objectives

General Objective

To *reduce the high percentage of IDA* in pregnant mothers at 36 weeks POA in KKSA from 14.7 % to ***≤4%***

Specific Objectives

To ***verify percentage of IDA*** among pregnant mothers at 36 weeks in KKSA

To ***identify the possible causes and contributary factors*** associated with IDA in pregnancy among pregnant mothers in KKSA

To ***formulate and implement remedial measures*** to decrease the percentage of IDA in pregnancy among pregnant mothers in KKSA

To ***evaluate effectiveness*** of the remedial measures taken

Key Measures for Improvement - Clinical Indicators

NOT A KPI STUDY!

Indicator

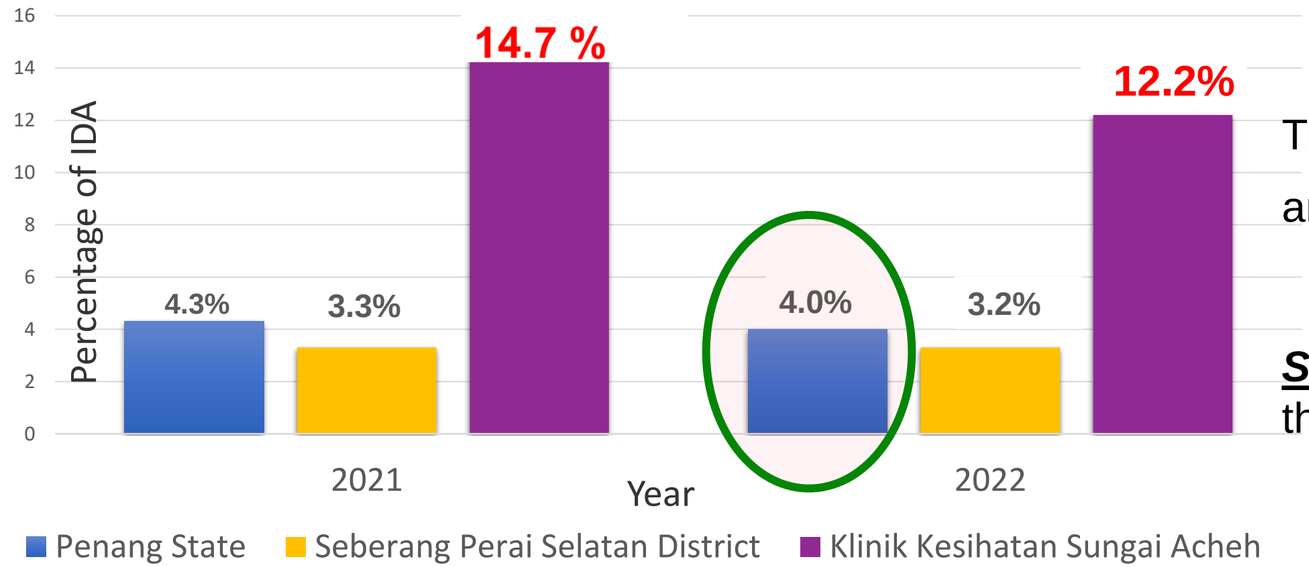
Percentage of pregnant mothers with IDA at 36 weeks POA

Formula

Numerator : Number of registered pregnant mothers with IDA at 36 weeks POA

Denominator: Total number of registered pregnant mothers at 36 weeks POA

x 100%



Comparing percentage of IDA in Pregnant Mothers at 36 weeks POA between Penang State, Seberang Perai Selatan District and KK Sungai Acheh 2021/2022

Standard

The *standard for the indicator* is percentage of IDA among pregnant mothers at 36 weeks ***≤4%***

Study Indicator Justification - Our aim was to achieve the Penang state wide percentage of IDA at 4 %

Based on concensus by team and facilitators -Bengkel Pemantapan Projek QA DSA Bahagian Kesihatan Awam, Jabatan Kesihatan Negeri Pulau Pinang Sept 2022

Process of Gathering Information – Methodology

QA STUDY : Towards reducing the high percentage of Iron Deficiency Anemia among pregnant mothers in KK Sg Acheh	
Type of Study	**Quasi Experimental Study**
Study Period	**Verification Study Phase 1st Oct- 31st October 2022** **Pre Remedial Phase :Nov 2022 -Feb 2023** **Remedial Cycle 1 Mac - Jun 2023** **Post Cycle 1 July 2023** **Remedial Cycle 2 Aug - Nov 2023** **Post Cycle 2 Dec 2023** **Remedial Cycle 3 Dec 2023-Feb 2024** **Post Cycle 3 Mac 2024**
Study Population	**All pregnant mothers registered in MCH Unit KKSA as documented in Census (KIB 201_B)**
Sampling Technique	**Universal Sampling Method**
Inclusion Criteria	**At least 2 Antenatal Visits in KKSA**
Exclusion Criteria	**1.Patients with confirmed diagnosis of haemoglobinopathy such as Thallasaemia Carriers , HbE disease etc..** **2.Patients with anemia of chronic illness e.g CKD, Malignancies, Autoimmune disease** **3.Other nutritional anemias such as B12/ Folate Deficiency**
Sampling Tools	**Patient IDA awareness questionnaire** **Staff knowledge assessment questionnaires** **IDA Counselling Audit Data Collection form** **IDA counselling tools questionnaire** **IDA Management Data Collection form.**

Sampling Tool - Effectiveness of IDA Counselling

Sampling Tool 1	Staff Counselling Tools Questionnaire	Sampling Tool 2	IDA Counselling Audit Data Collection form
Objective	To assess types and effectiveness of IDA counselling materials used by healthcare worker in KKSA	**Objective**	To review effectiveness of IDA counselling done in antenatal mothers

INTERVIEW QUESTIONS

NAMA: JAWATAN:

UNIT: TAHUN BERKHIDMAT:

1. Apakah bahan promosi / rujukan yang anda gunakan semasa proses kaunselling ANEMIA untuk ibu mengandung?

- ☐ Pamplet Tersedia
- ☐ Panduan NNA Ibu Hamil Risiko Kes Anemia
- ☐ Lain-lain, sila nyatakan…….
- ☐ Tidak ada

2. Adakah anda merasakan bahan promosi yang terdapat pada masa sekarang adalah mencukupi dan effective untuk mencegah penyakit anemia waktu mengandung?

- ☐ Ya
- ☐ Tidak

3. Apakah jenis bahan promosi/ rujukan lain yang anda ingin mengunakan untuk memudahkan proses kaunselling anda untuk ANEMIA di kalangan ibu mengandung?

…….

…….

4. Adakah anda merasakan keperluan untuk mewujudkan bahan promosi digital?

- ☐ Ya
- ☐ Tidak

5. Adakah anda merasakan mengalami kesukaran meneruskan proses kaunselling di kalangan ibu yang tidak fasih berbahasa Melayu ?

- ☐ Ya
- ☐ Tidak

BORANG CHECKLIST KAUNSELLING ANEMIA UNTUK IBU MENGANDUNG

TAJUK	TARIKH	TAJUK	TARIKH
APAKAH ITU ANEMIA? Kurangseldarah merahdalam badan (Hb < 11%) Hampir 65% ibu meghidap penyakit anemia waktu mengandung		**CARA PENGAMBILAN** Perut Kosong/ 2 jamselepas makan dengan air kosong/ minuman mengandungi vitamin C (limau/ oren) Jangandiambil dengan kopi, teh, susu ataupun pil kalsium	
PUNCA ANEMIA Kurang zat BESI (puncautama) Kurang zat Vit B12/ Asid Folik Thallasaemia (Penyakit Genetik) Jangkitan (TB/ Cacing) Pendarahan		**TANDA-TANDA ANEMIA** Cepat Penat/ Letih / Lesu Pucat Pening Jantung Berdebar Sesak Nafas	
KEPENTINGAN ZAT BESI Kurang Zat BESI adalahpuncautama ANEMIA (zat besi membantu dalam pembentukansel darahmerah) Permakanan tinggi dalam zat besi adalah penting – terangkan jenis makananyang kaya denganzat besi Permakanan sahajatidak mampu mencegah penyakit ANEMIA Pengambilan Pil Besi SETIAP HARI secara betul juga penting		**KOMPLIKASI ANEMIA** **IBU** Sesak Nafas, Tak Bermaya, Risiko Tumpahan Darah Bersalin Risiko Transfusi Darah SeranganJantung **BAYI** Kelahiran Pramatang Kelahiran Kurang Berat Badan Meninggaldalam Kandungan Masalah Tumbesaran/ Pembelajaran waktu Kanak-kanak	
PIL BESI Jenis Pil BESI yang dibekalkan (Klien mesti tahu nama pil) Kekerapan perlu diambil Ambilwaktu yang sama setiap hari Mesti diambil SETIAP HARI		**KESAN SAMPINGAN PIL BESI** Kesan Sampingan termasuklah loya, muntah, cirit-birit, sembelit, sakit perutdan pening. Jika mengalami kesan sampingan, perlumaklumkan segerauntuk penukaran pil yang lebih sesuai	

Sampling Tool - Inadequate IDA Management

Sampling Tool 3	Staff IDA Knowledge Questionnaire	Sampling Tool 4	IDA Management Data Collection form
Objective	Measuring knowledge , attitude and practice of prevention and management of IDA among staff in KKSA	**Objective**	To assess adherence to IDA management protocol. *Score of 70% and above taken as adequate*

SOALAN KAJISELIDIK "ANEMIA DIKALANGAN IBU HAMIL" DIKALANGAN ANGGOTA.

NAMA:

JAWATAN:

TEMPOH BERTUGAS:.....(TAHUN)

1. Nyatakan definasi anemia semasa kehamilan

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2. Nyatakan 3 klassifikasi hemoglobin.

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3. Tolong nyatakan

a) 5 ciri-ciri klinikal yang dialami ibu hamil yang mengalami Anemia.

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b) 3 komplikasi yang dialami bayi yang dikandung ibu anemia.

4. Bagaimana anda menguruskan ibu hamil yang mempunyai paras Hb 8 – 10.9 gm % datang ke klinik anda pada usia kandungan 36 minggu. Sila nyatakan:-

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5. Apakah penyiasatan yang perlu jika ibu hamil mengalami Anemia yang mempunyai paras Hb < 10 gm %. Sila nyatakan:-

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6. Sebutkan antara 3 perkara yang perlu diberikan semasa pemberian pendidikan kesihatan ibu hamil Anemia.

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7. Antara perkara-perkara yang perlu dibuat penilaian bagi memastikan ibu hamil Anemia mengambil hematenik mengikut arahan atau tidak.

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8. Nyatakan tag warna risiko kehamilan yang betul untuk situasi berkenaan-

a) Ibu mengandung 28 minggu dengan nilai Hb 8.2 tanpa symptom anemia.

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b) Ibu mengandung 7 minggu dengan hb 9.8 dengan jantung berdebar-debar dan pucat .

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9. Sila nyatakan kandungan elemental iron yang terdapat dalam setiap pil hematinic berkenaan"

a) Maltofer _____ d) Obimin _____

b) Zincofer _____ e) Ferrous Fumarate _____

c) Iberet _____

10 .) Apakah pelan rawatan selanjutnya untuk ibu mengansung 32 minggu dengan Hb 9 yang tidak dapat makan pil hematinic disebabkan kesan sampingan yang terlampau teruk seperti loya dan muntah?

NO	PROCESS	CRITERIA	DONE	NOT DONE	COMMENT
1.	Booking Registration at MCH counter	Registration and opening of Antenatal Card for all pregnant mothers in current pregnancy at MCH Registration counter			
2.	Booking Assessment	1st Routine Medical Examination- All relevant History Taking, Vital Signs, Anthropometric Measurements/ Physical Examination and Investigations including Booking FBC to be dome by Medical Officer/ Nurses respectively			
3.	Scan QR Code For Visual Teaching Tool	All booking Antenatal mothers to scan the QR code for Visual Teaching Tool at booking with assistance from respective nurses			
4.	Review booking FBC	All new registered mothers to be reviewed FBC , given prophylactic oral iron T. Ferrous Fumarate 200 mg OD and IDA counselling regardless Anemia status on booking visit.			
5.	Anemia in Pregnancy Diagnosis	All Anemia cases to be clerked via standardized clerking sheet			
		Medical Officer to order appropriate investigations- Iron studies if suspected IDA			

NO	PROCESS	CRITERIA	DONE	NOT DONE	COMMENT
6.	IDA Management	To prescribe daily dose of at least 120 mg of oral elemental iron for all IDA mothers			
		IDA counselling done by nurse / MO according to standardized anemia counselling checklist			
		To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks			
		Severe Anemia (Hb< 7 and/ or symptomatic anemia) to be referred immediately to O&G team			
7.	Ptn Reassessment in 2/52	All IDA mothers to be seen in 2/52 by MO to review repeat FBC & iron studies			
		Compliance check and optimization of oral iron therapy			
		Referral for Parenteral iron (Intolerant to oral iron/ non compliance/no improvement in Hb in patients after first trimester)			
8.	Refer FMS if Hb <11	All mothers who still have IDA despite optimization of treatment to be discussed with Family Medicine Specialist for further Management			

Sampling Tools - Compliance to Haematenic

Sampling Tool 5	Patient IDA awareness questionnaire
Objective	Measuring level of awareness of IDA in and compliance of hematenics among antenatal mothers in KKSA .

PENGETAHUAN ANEMIA DI KALANGAN IBU MENGANDUNG

1. Sila tandakan makanan-makanan yang tinggi dengaz zat besi (boleh tanda lebih dari satu)
   - ☐ Ikan Bilis
   - ☐ Daging Merah
   - ☐ Sayuran Hijau Berdaun
   - ☐ Ikan Bersisik
   - ☐ Buah Oren
   - ☐ Kismis
   - ☐ Tomato
   - ☐ Kerang
   - ☐ Kacang Kuda
   - ☐ Susu Segar

2. Apakah komplikasi - komplikasi yang boleh berlaku jika ibu mengalami anemia waktu mengandung? (Boleh tanda lebih dari satu)
   - ☐ Kelahiran Bayi kurang berat badan
   - ☐ Bayi berat badan berlebihan
   - ☐ Bayi lahir melebihi tarikh bersalin
   - ☐ Kelahiran Bayi Pramatang
   - ☐ Risiko transfusi darah jika berlaku tumpah darah berlebihan waktu mengandung

3. Tandakan kenyataan-kenyataan yang BETUL berkenaan pengambilan pil haematenic
   - ☐ Pil haematenic perlu diambil serta-merta selepas makan
   - ☐ Pil haematenic perlu diambil dalam perut kosong atau 2 jam selepas makan
   - ☐ Pil haematenic elok diambil bersama susu
   - ☐ Pil haematenic elok diambil bersama jus oren
   - ☐ Pil haematenic perlu diambil dengan makanan tinggi serat untuk elakkan sembelit

4. Saya merasakan pernyataan berikut adalah betul- boleh tanda lebih daripada satu
   - ☐ Mengamalkan permakanan yang tinggi dengan zat besi adalah cukup untuk menghindari penyakit anemia.
   - ☐ Pil hematinic seharusnya tidak diambil kecuali tahap anemia betul-betul teruk.
   - ☐ Pil hematinic akan berkesan walaupun diambil selang sehari sebab kandungan zat besinya tinggi.
   - ☐ Pengambilan pil hematinic akan menyebabkan bayi dalam kandungan menjadi besar.
   - ☐ Ibu mengandung yang tidak mempunyai anemia juga seharusnya mengambil pil hematinic untuk mencegah penyakit ini.

BORANG SOALAN KAJISELIDIK ANEMIA DI KALANGAN IBU MENGANDUNG

KLINIK KESIHATAN SUNGAI ACHEH

NAMA : .....NOKP : .....

KAWASAN: .... TAHAP PENDIDIKAN: .....

TARIKH LAWATAN ANTENATAL PERTAMA:.....KEDUA :.....

PENGAMBILAN PIL HAEMATENIC DAN KESAN SAMPINGAN

1. Adakah anda mengambil pil hematinic? Jika Ya, pil hematinic apakah yang anda ambil?
   - ☐ Ferrous Fumarate
   - ☐ Zincofer
   - ☐ Iberet
   - ☐ Maltofer
   - ☐ Saya tidak ada ambil apa-apa pil hematinic
   - ☐ Saya ada mengambil pil haematenic tetapi tidak pasti namanya

2. Adakah anda mengalami apa-apa kesan sampingan daripada mengambil pil hematinic?
   - ☐ Ya , sila nyatakan: .....
     .....
   - ☐ Tidak

3. Berapa kerap anda mengambil pil hematinic seperti yang disarankan oleh petugas kesihatan?
   - ☐ 1-2x/ seminggu
   - ☐ 3-5x/ seminggu
   - ☐ Setiap hari
   - ☐ Bila teringat untuk ambil

4. Sekiranya anda tidak mengambil pil hematinic mengikut kekerapan yang disarankan oleh petugas kesihatan, sila nyatakan sebab:
   - ☐ Kesan Sampingan dari Pil
   - ☐ Terlupa
   - ☐ Merasakan pil hematinic itu tidak penting waktu mengandung
   - ☐ Lain-lain , sila nyatakan .....

Process of Gathering Information: Indicator Data Collection

Problem : High percentage of pregnant mothers with iron deficiency anemia in KKSA			
Data need to be collected			**Data Collection Tools**
Indicator Data	**Numerator**	Number of registered pregnant mothers with IDA at 36 weeks POA	Patient Medical Records (Antenatal Card KIK/1 (b)/96
	Denominator	Total number of registered pregnant mothers at 36 weeks POA	Antenatal Registry Census(KIB 201_B)
Contributary Factor Data	Effectiveness of IDA Counselling		IDA Counselling Audit Data Collection form
	Adequate Management of IDA		IDA Management Data Collection form
	Compliance to Haematenics		Patient IDA awareness questionnaire

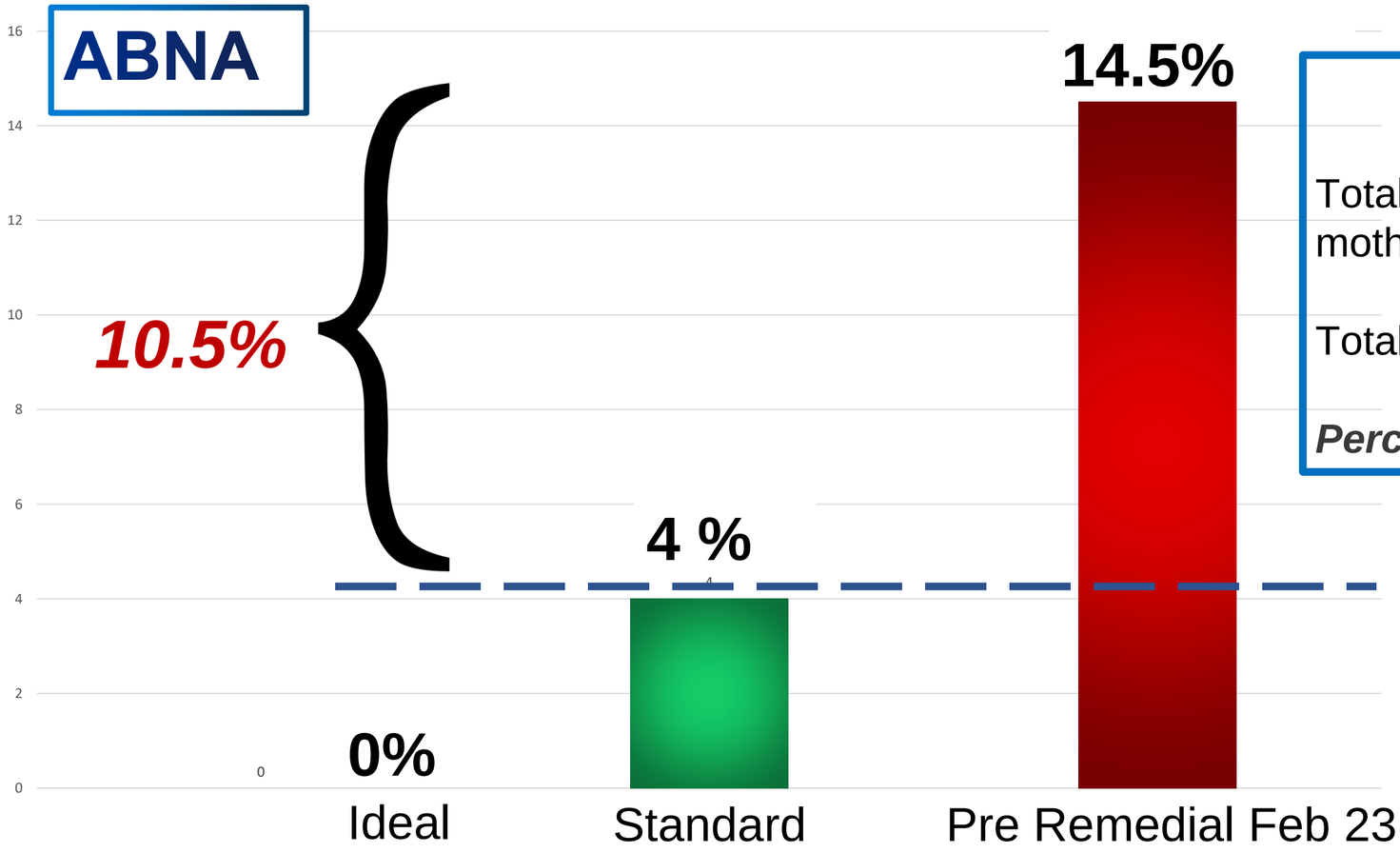
Indicator , factor and variable data collection was done during pre remedial cycle as verification and post each remedial cycle to evaluate the effectiveness of remedial measures

Process of Gathering Information: Factor Data Collection

Factors Identified	Variables	Sampling Tool	Sampling Technique	Sampling	Sample Size	Standard
Standardized IDA Counselling	Utilization of Digital Counselling Tools	Staff Counselling Tools Questionaire	Interview	Convinience – 10 Medical Officers/ 20 MCH nurses	30	100 % Effective
	Standardized IDA Counselling done		Record Review	Universal- Review ANC Card KIK/1 (b)/96	60	100% Effective
Adequate Management of IDA	Knowledge on correct dosage /prescription of elemental iron	Staff knowledge assessment questionnaires	Self Administered	Convenience – 10 Medical Officers/ 20 MCH nurses	30	100% Accurate
	Ordering of appropriate IDA investigations Nutritionist referral within 2 weeks Appropriate Referral for parenteral Iron Timely referral to FMS	IDA Management Data Collection form	Record Review	Convenience Review ANC Card KIK/1 (b)/96	60	100% Accurate
Compliance to Haematenics	Awareness on IDA among patients	Patient IDA awareness questionnaire	Interview	Convinience - pregnant mothers registered with at least 2 AN visits	60	100% Understanding
	Proper compliance check done	IDA Management Data Collection form	Record Review	Universal- Review ANC Card KIK/1 (b)/96	60	100% Accurate

Data Analysis and Interpretation : Pre Remedial Indicator Data and ABNA

Achievable Benefit Not Achieved



Indicator Data

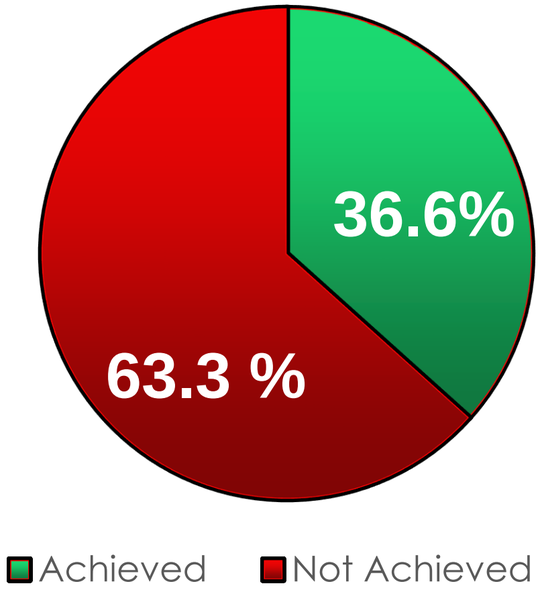
Total number of registered antenatal mothers: *110 (Sample size*)

Total IDA cases : *16*

Percentage of IDA : 14.5%

Pre Remedial Factor Data : Ineffective Counselling

Percentage of Antenatal card achieving 100% score on IDA Counselling Audit



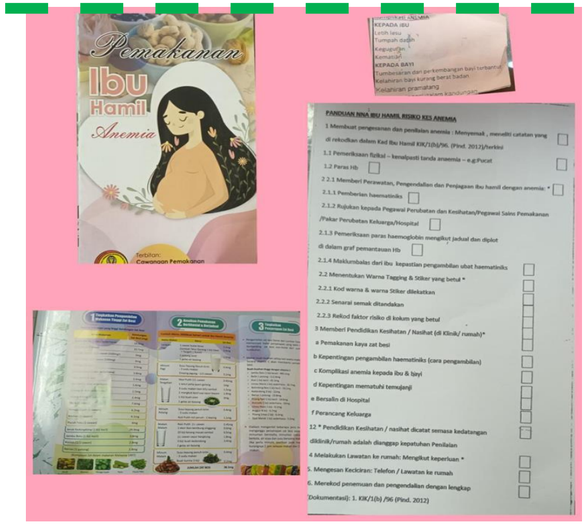
Factor Data 1 - Effective IDA Counselling : 36.6%

(Percentage of audited antenatal cards with effective and complete IDA counselling done)

- Subtopic most often *missed* :
  Correct method of consuming haematenics
- No *standardized* IDA counselling checklist

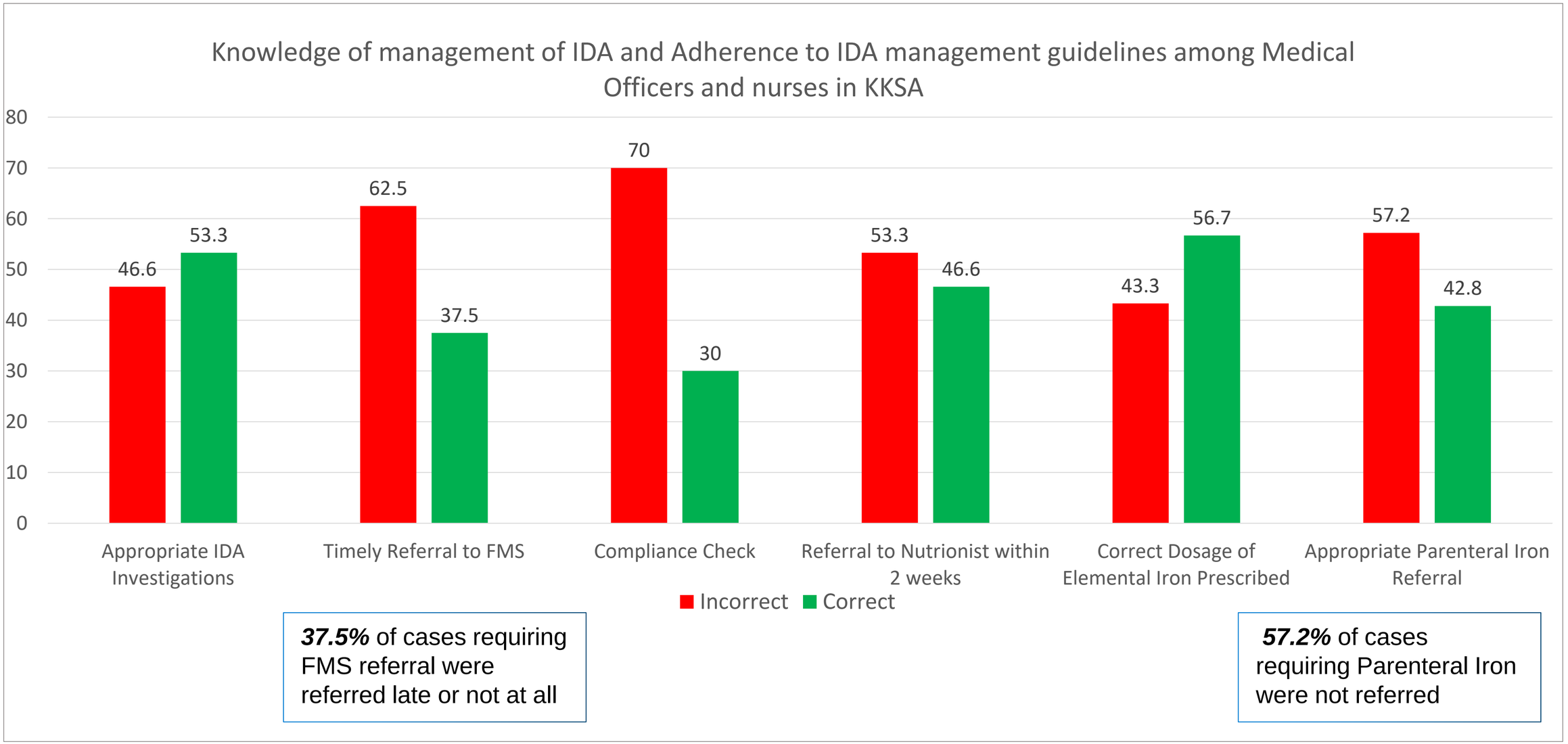
What are the tools used by nurses and medical officers for IDA Counselling ?

- **NO** counselling reference or material : **33%**
- ***0%*** *of staff used any form of Digital Counselling Tool*
- Other materials :



- ***Feedback*** : 78% of staff felt a *digital counselling tool would ease the process* as many younger antenatal patients are **active in Tik Tok and Youtube.**

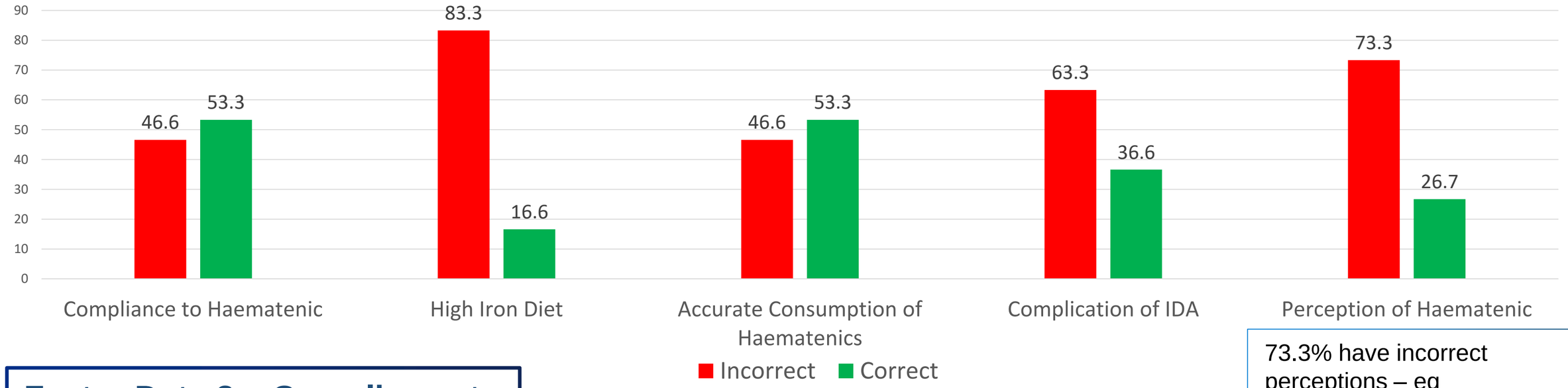
Pre Remedial Factor Data - Inadequate IDA Management



Factor Data 2 – Adequate IDA Management : 23.3%

Patient antenatal cards scoring ≥ 70% on IDA Management Audit

Pre Remedial Factor Data – Poor Compliance to Haematenics



Factor Data 3 – Compliance to Haematenic : 53.3%

Percentage of pregnant mothers with level of acceptable IDA awareness IDA : 8.3%

73.3% have incorrect perceptions – eg *haematenics can cause big babies*

Pre Remedial Data – Morbidity and Mortality

IDA cases requiring Maternal Blood Transfusions • 5 cases

IDA Associated Stillbirths • 2 cases

Conformation To Model of Good Care (MOGC)

Process	Criteria	Standard	Pre Remedial Feb 2023
1. Standardized IDA Counselling	**QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis**	**100%**	**0%**
	IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	**100%**	**0%**
2.IDA Management Protocol	**Medical Officer to order appropriate investigations for IDA-** **Suspected IDA Hb <11 with Microcytic Hypochromic Picture -** Serum Feritin/ Iron Studies **Suspected Other Causes-** Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout	**100%**	**53.3%**
	To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	**100%**	**43.3%**
	To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	**80%**	**46.6%**
	Appropriate Referral for Parenteral Iron	**100%**	**42.8%**
	Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	**80%**	**37.5%**
3.Compliance Check and Optimization of Haematenics	**Compliance check and optimization of Haematenics**	**100%**	**30%**
	Assessment of patient awareness of IDA in pregnancy - Able to correctly answer at least *3 out of 4 components* (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics)	**80%**	**8.3%**

Overview of shortfall in quality and strategies for change

Total of 10 remedial strategies over 3 remedial cycles in 18 months

Shortfall in Quality	Criteria	Strategy for Change
1. Ineffective Counselling	Lack of Digital Counselling Tool	Digitization of IDA Counselling across multiple platforms
	Lack of Standardized IDA Counselling	Standardization of IDA Counselling Protocol Digitization of IDA Counselling across multiple platforms
2. Inadequate Management of IDA	Delayed Ordering of Appropriate Investigations	Improvement of IDA Management Tools Development and Training of Inhouse IDA Management Protocol
	Delayed Referral to Nutrionist	Development and Training of Inhouse IDA Management Protocol Improvement of IDA Management Tools
	Inappropriate dosage oral elemental iron prescribed	Development and Training of Inhouse IDA Management Protocol Improvement of IDA Management Tools
	Delayed Referral for Parenteral iron	Inhouse Parenteral Iron Therapy Guideline Creation of IDA Database and Workstation Improvement of IDA Management Tools
	Late Referral to Family Medicine Specialist	Development and Training of Inhouse IDA Management Protocol Creation of IDA Database and Workstation
3. Poor Compliance to Haematenics	Lack of Awareness on IDA	Interactive IDA Awareness Promotional Activities Expansion of QA to Outpatient Department Expansion of QA to Community Digital Information Pamphlets
	Compliance Check not done properly	Digital Information Pamphlets Improvement of IDA Management Tools

Remedial Cycle 1 - Strategies For Change

March-June 2023

Remedial Cycle 1 – Strategies for Change

STRATEGY 1 : Digitization of IDA Counselling Across Multiple Social Media Platforms

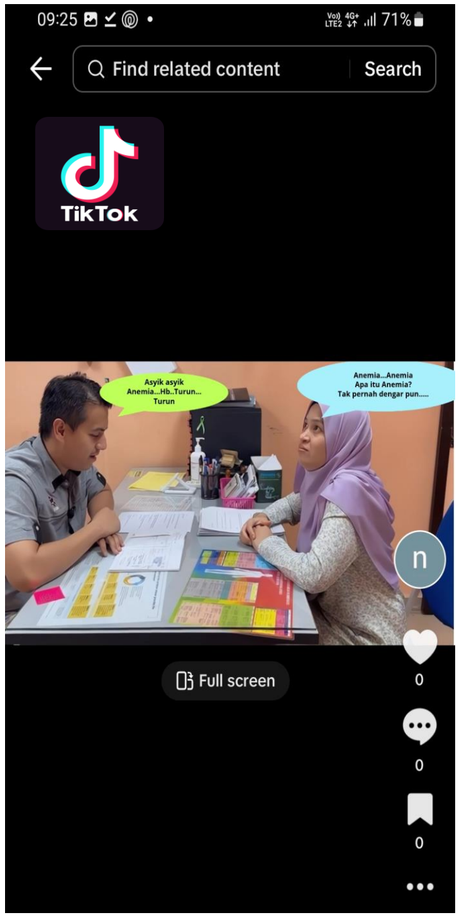
SIQ : Lack of Digital Counselling Tool

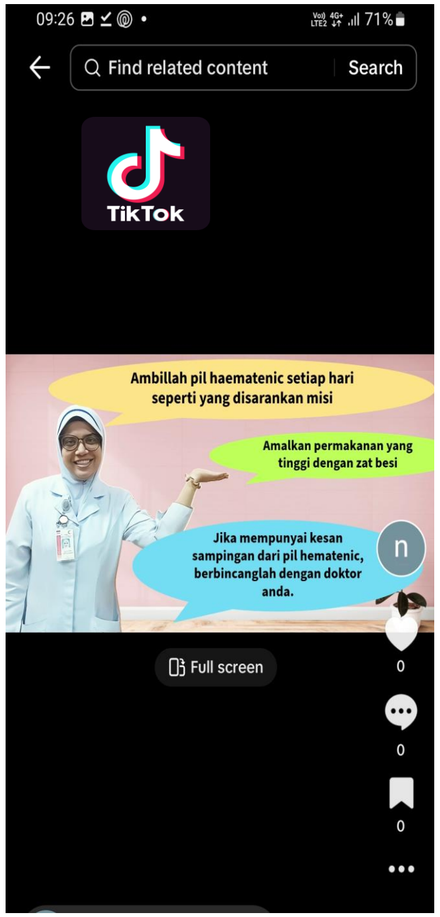
Interventions :

- ✓ ***Creation of IDA Education Youtube Channel***
- ✓ ***Youtube Digital Counselling Tool***
- ✓ ***Tik Tok Digital Counselling Tool***

- ***WHY ?*** –Mobile health interventions can be systematically implemented to address *critical maternal health issues* in low and middle income countries – Choudhury et al., 2023

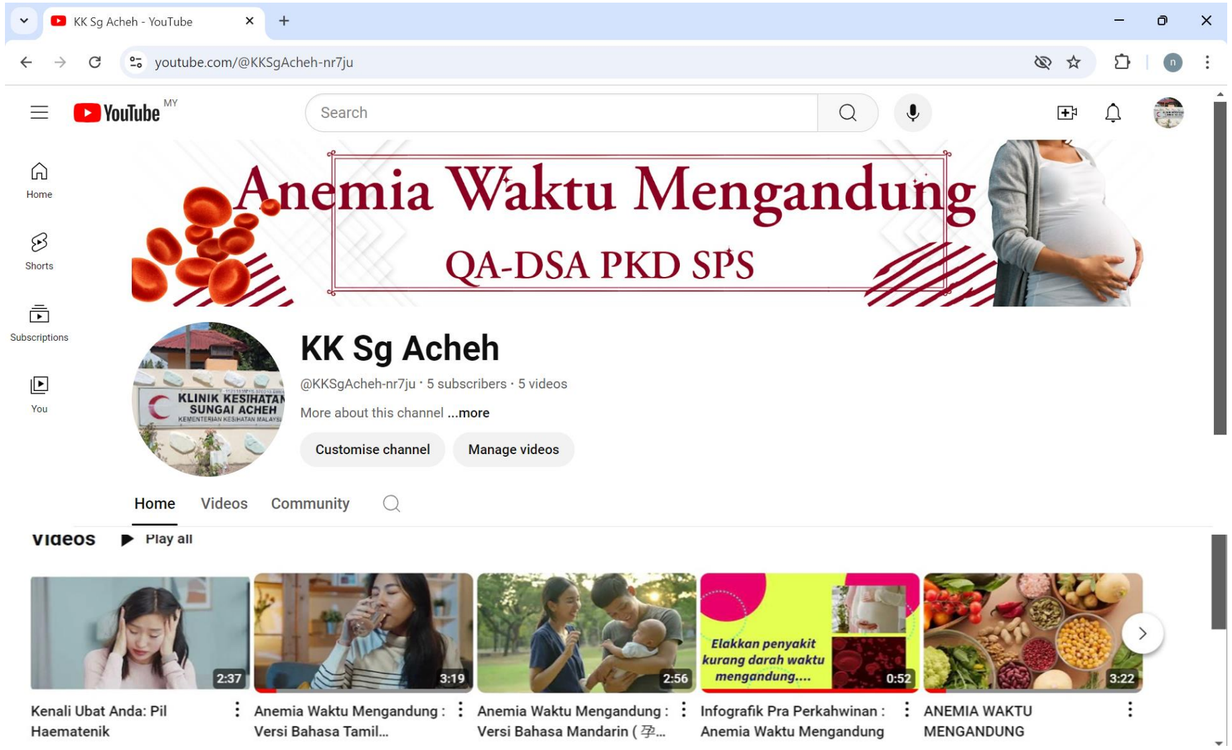
- Adhere to ***Health Believe Model Concept***





Content : Address *IDA awareness*, importance and side effects of haematenic in Bahasa Malaysia

Remedial Cycle 1 – Strategies for Change



Digital Counselling Tool
Anemia Waktu Mengandung

Sila scan saya!!

- Assessible to ***all*** patients and staff via **QR CODE**
- All antenatal patients to view tool on booking
- ***Step 2*** **in** ***Process of Care***

Subsequent platform for IDA digital counselling tools in ***Mandarin*** and ***Tamil*** as well as digital IDA pamphlets

Digital counselling tools were fine tuned multiple times taking in to account *patient feedback.*

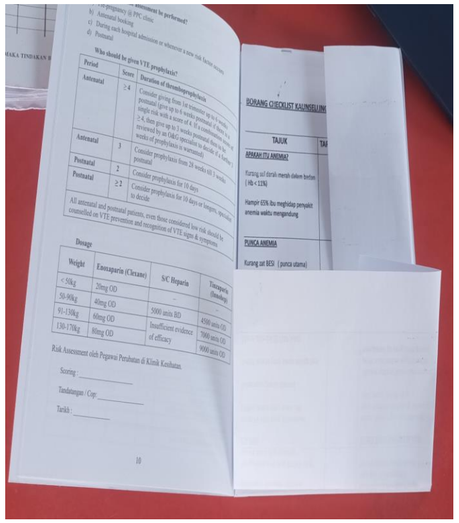
Remedial Cycle 1 – Strategies for Change

STRATEGY 2 : Standardization of IDA Counselling Protocol

SIQ : Lack of Standardized IDA Counselling

PRE REMEDIAL : Topics frequently missed with no proper documentation of topics covered

POST REMEDIAL:



BORANG CHECKLIST KAUNSELLING ANEMIA UNTUK IBU MENGANDUNG

TAJUK	TARIKH	TAJUK	TARIKH
APAKAH ITU ANEMIA? Kurangseldarah merahdalam badan (Hb < 11%) Hampir 65% ibu meghidap penyakit anemia waktu mengandung		**CARA PENGAMBILAN** Perut Kosong/ 2 jamselepas makan dengan air kosong/ minuman mengandungi vitamin C (limau/ oren) Jangandiambil dengan kopi, teh, susu ataupun pil kalsium	
PUNCA ANEMIA Kurang zat BESI (puncautama) Kurang zat Vit B12/ Asid Folik Thallasaemia (Penyakit Genetik) Jangkitan (TB/ Cacing) Pendarahan		**TANDA-TANDA ANEMIA** Cepat Penat/ Letih / Lesu Pucat Pening Jantung Berdebar Sesak Nafas	
KEPENTINGAN ZAT BESI Kurang Zat BESI adalahpuncautama ANEMIA (zat besi membantu dalam pembentukansel darahmerah) Permakanan tinggi dalam zat besi adalah penting – terangkan jenis makananyang kaya denganzat besi Permakanan sahajatidak mampu mencegah penyakit ANEMIA Pengambilan Pil Besi SETIAP HARI secara betul juga penting		**KOMPLIKASI ANEMIA** **IBU** Sesak Nafas, Tak Bermaya, Risiko Tumpahan Darah Bersalin Risiko Transfusi Darah SeranganJantung **BAYI** Kelahiran Pramatang Kelahiran Kurang Berat Badan Meninggaldalam Kandungan Masalah Tumbesaran/ Pembelajaran waktu Kanak-kanak	
PIL BESI Jenis Pil BESI yang dibekalkan (Klien mesti tahu nama pil) Kekerapan perlu diambil Ambilwaktu yang sama setiap hari Mesti diambil SETIAP HARI		**KESAN SAMPINGAN PIL BESI** Kesan Sampingan termasuklah loya, muntah, cirit-birit, sembelit, sakit perutdan pening. Jika mengalami kesan sampingan, perlumaklumkan segerauntuk penukaran pil yang lebih sesuai	

- ✓ Standardized Counselling Checklist in every ANC Card with nurses to counsel on each subtopic accordingly

STRATEGY 3 :Improving IDA Management Tools

SIQ : Compliance Check not done properly
Inappropriate Dosage Oral Elemental Iron prescribed
Delayed Ordering of appropriate Investigations
Delayed referral to Nutritionist
Delayed Referral to Parenteral Iron

- ✓ Reinforce *accurate IDA management*
- ✓ *Ease workflow process* for medical officers and nurses

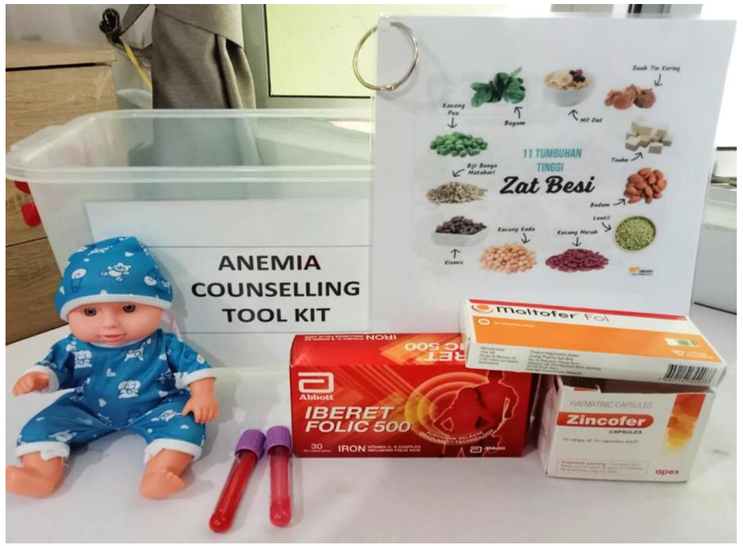
Readily assessable !!

Currently expanded to all clinics in PKD SPS

Remedial Cycle 1 – Strategies for Change

IDA Management Tools

Anemia Counselling Toolkit Box



✓ **Interactive IDA counselling method**

✓ **Suitable if there is no internet**

Inhouse Anemia Clerking Sheet Tool

Anemia Clerking Sheet Date : _____

Age : _____ Gravida : _____ Para:_____

Antenatal Issues:

_____

_____

Hb at Booking		POA/ Date	
Current Hb		POA/ Date	

Risk Factors		Risk Factors	
Multiparity		Teenage Pregnancy	
Prev Hx of Anemia		Haemoglobinopathies	
Family Hx of Thallasaemia		Vegetarian	
Poor Spacing		Previous Hx of PPH	

Hx of Parenteral Iron:		Hx of Blood Transfusion:	

Symptoms		Symptoms	
Dizziness		Chest pain	
Lethargy		Shortness of breath	
Palpitation		Reduced effort tolerance	

Examination		Examination	
Pallor		Koilonychia	
Glositis/ Stomatitis		Hepatosplenomegaly	
Jaundice		Cardiac Murmur	

Dosage of current Haematenics:				
Compliance to Haematenics	YES		NO	
Correct consumption of Haematenics	YES		NO	
Stool Colour :				

Side Effects of Haematenics	YES		NO
If yes, please specify :			

INVESTIGATIONS	DATE	RESULTS
Iron Studies		
Serum Feritin		
Hb Analysis		
Peripheral Blood Smear		
Vit B12/ Folate		
Stool Ova Cyst		
Tb Screening		

Diagnosis	Date	Diagnosis	Date
Iron Deficiency Anemia		Vit B12/ Folate Deficiency	
Thallasaemia Carrier		Anemia of Chronic Disease	
Other Haemaglobinopathies		Infection (TB, Hookworm etc)	
Others (Specify) :			

Impression : _____

Plan

1. Haematenics Dose :_____
2. Ensure compliance to haematenics
3. IDA counselling
4. Refer PSP for iron rich diet
5. TCA _____
6. Refer FMS for further Management Yes ☐ No ☐
7. Refer O&G for Parenteral Iron Yes ☐ No ☐
8. Monthly scan at _____ wks

✓ **Standardized clerking for all anemia cases**

✓ **Ensure correct investigations ordered**

✓ **Ensure timely referral to nutritionist**

Compliance Checklist

SENARAI SEMAK PENGAMBILAN PIL HAEMATENIC

Tarikh	Jenis Pil dan Dos	Kompliant		Masalah Kesan Sampingan Yang Dialami			Rujukan Pegawai Perubatan	
		Warna Najis	Baki Pil Yang Tinggal	Sakit Perut/Loya/ Muntah	Sembelit	Sakit Kepala	YA	TIDAK

✓ **Nurses to use checklist for compliance checklist on every visit**

Elemental Iron Dosage Card

ELEMENTAL IRON DOSAGE CARD

PREPARATION	ELEMENTAL IRON (mg/tablet)	EXAMPLE	MAXIMUM DOSING
Ferrous Fumarate (200 mg)	60		400 mg bd
Iberet Folic 500	105		1/1 bd
Obimin / Obimin plus	30		1/1 od
Maltofer	100		1/1 bd
Zincofer	115		1/1 bd

✓ **Iron dosage chart to be prepared on all nurses and MO table for easy reference**

Remedial Cycle 1 – Strategies for Change

STRATEGY 4 :Development and Training of Inhouse IDA Management Protocol

SIQ: Delayed Ordering of Appropriate Investigations
Delayed Referral to Nutritionist
Inappropriate dosage oral elemental iron prescribed
Late Referral to Family Medicine Specialist

PRE REMEDIAL :

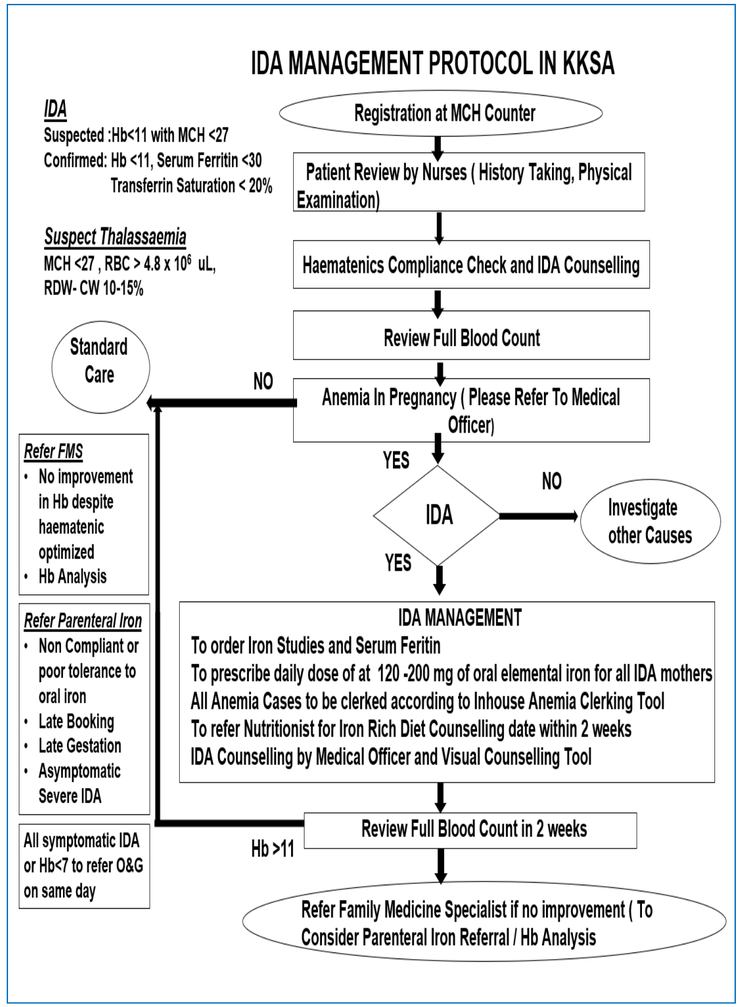
- No standardized guideline for Management of Anemia in Primary Care in Penang (2022)
- Standard perinatal care manual not referred during daily workflow process

POST REMEDIAL :

✓ Guideline developed by Family Medicine Specialists to guide on management of IDA

✓ Ease workflow process

IDA Management Protocol in KKSA



Made available at registration counter, nurses station and medical officer table

Training / CME on protocol given to Medical Officers and nurses

Conformation To Model of Good Care (MOGC)

Process	Criteria	Standard	Pre Remedial Feb 2023	Post Cycle 1 July 2023
1. Standardized IDA Counselling	QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis	100%	0%	35%
	IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	100%	0%	38.3%
2.IDA Management Protocol	Medical Officer to order appropriate investigations for IDA- Suspected IDA Hb <11 with Microcytic Hypochromic Picture - Serum Feritin/ Iron Studies Suspected Other Causes- Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout	100%	53.3%	65%
	To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	100%	43.3%	66.6%
	To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	80%	46.6%	51.6%
	Appropriate Referral for Parenteral Iron	100%	42.8%	50%
	Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	80%	37.5%	42.8%
3.Compliance Check and Optimization of Haematenics	Compliance check and optimization of Haematenics	100%	30%	60%
	Assessment of patient awareness of IDA in pregnancy - Able to correctly answer at least *3 out of 4 components* (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics	80%	8.3%	28.3%

Remedial Cycle 2 - Strategies For Change

Aug-Nov 2023

Remedial Cycle 2 – Strategies for Change

STRATEGY 5 : Expanding QA to Outpatient Department

SIQ : Lack of Awareness on IDA

PRE REMEDIAL :

1.Outpatient / Pre pregnancy clients not given awareness on IDA.

2. Outpatient Department Staff receive no training on IDA

POST REMEDIAL :

1.Target Pre Pregnancy Clients to promote IDA Awareness

✓ ***HIV Pre Marital Screening***

✓ ***Pre Pregnancy Clinic***

2.CME for *OPD staff* regarding IDA in pregnancy

A poor iron status with small or absent iron reserves before pregnancy will *increase the risk of IDA during pregnancy* - Milman N, et al. 2015.

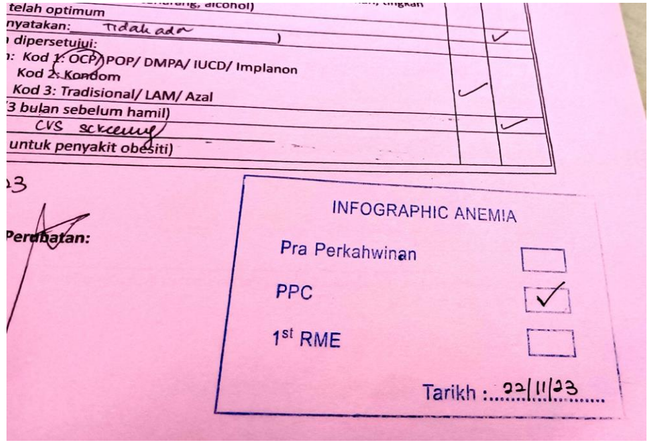
Expansion to Outpatient Department

All HIV Pre Marital clients in OPD encouraged to scan and view videographic while waiting for consultation.

Expansion to Pre Pregnancy Clinic

QR Code at Nurses Table for PPC Counselling

CME on IDA for OPD Staff



Stamp on Pre Pregnancy Counselling Form to verify scan of QR Code

Remedial Cycle 2 – Strategies for Change

STRATEGY 6 : Interactive IDA Promotional Activities

SIQ : Lack of Awareness on IDA

Promotional Activities

1.) Chit Chat Antenatal

2.) High Iron Diet Cooking Demonstrations

WHY? - Group discussion able to *provide a supportive environment to* participant and *inducing behaviour modification*

H. Hassan A Systematic Review on Methods Used in Health Education Intervention on Anaemia in Pregnancy -Mal J Med Health Sci 15(SP3): 77-83, Nov 2019

Chit Chat Antenatal

Monthly multidisciplinary programme : Involve Nutritonist/ OT/ Pharmacist/ Nurses/ Doctor

Target At Risk Pregnant/ Breastfeeding Mothers

Cooking Demonstrations

Target mothers at risk of IDA

Builts rapport between staff and patients

Remedial Cycle 2 – Strategies for Change

STRATEGY 7 : Creation of IDA Database and Workstation

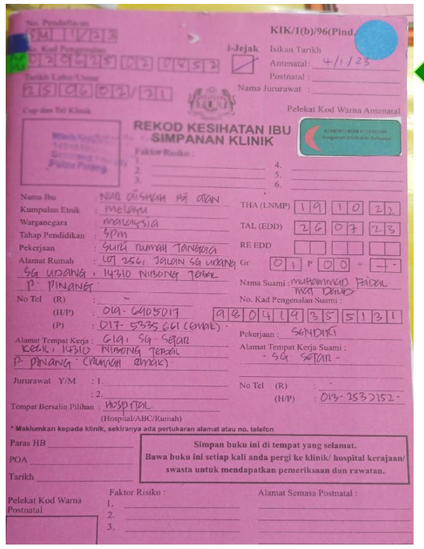
SIQ : Delayed Ordering of Appropriate Investigations
SIQ: Delayed referral for Parenteral Iron
SIQ: Delayed referral to Nutrionist

PRE REMEDIAL:

No early identification of risky IDA cases- late referral to FMS/ late referral for parental iron.

POST REMEDIAL:

1. Blue tag : Easy Identification of IDA cases



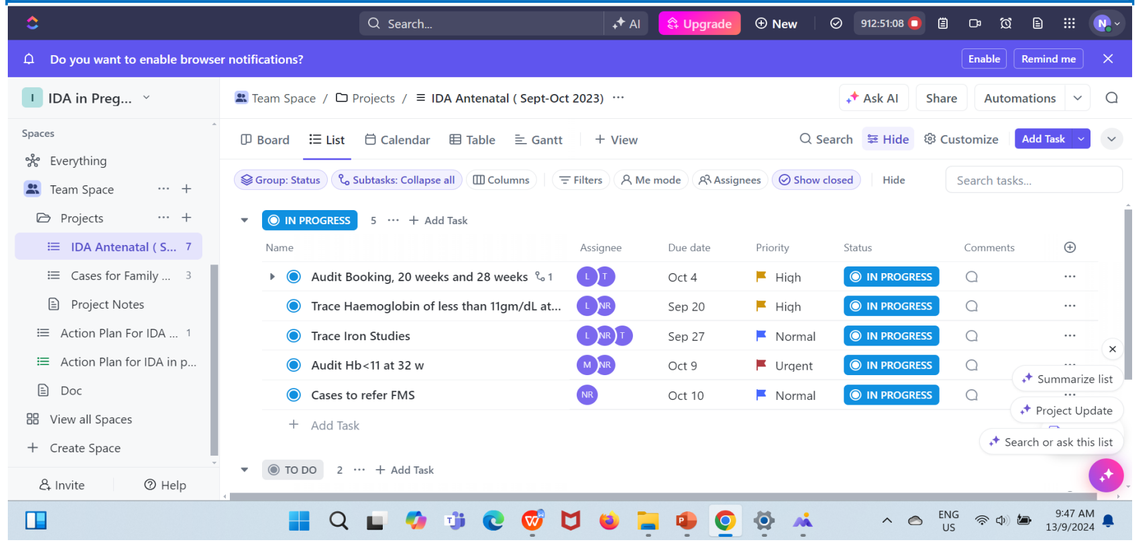
- ✓ ***Case which require parenteral iron referral***
- ✓ ***Case which require FMS referral***
- ✓ ***Regular feedback from healthcare workers***

2. Regular Audit using IDA Quality Audit to identify pitfalls in management

NO	PROCESS	CRITERIA	DONE	NOT DONE	COMMENT
1.	Booking Registration at MCH counter	Registration and opening of Antenatal Card for all pregnant mothers in current pregnancy at MCH Registration counter			
2.	Booking Assessment	1st Routine Medical Examination- All relevant History Taking, Vital Signs, Anthropometric Measurements/ Physical Examination and Investigations including Booking FBC to be dome by Medical Officer/ Nurses respectively			
3.	Scan QR Code For Visual Teaching Tool	All booking Antenatal mothers to scan the QR code for Visual Teaching Tool at booking with assistance from respective nurses			
4.	Review booking FBC	All new registered mothers to be reviewed FBC , given prophylactic oral iron T. Ferrous Fumarate 200 mg OD and IDA counselling regardless Anemia status on booking visit.			
5.	Anemia in Pregnancy Diagnosis	All Anemia cases to be clerked via standardized clerking sheet			
		Medical Officer to order appropriate investigations- Iron studies if suspected IDA			
6.	IDA Management	To prescribe daily dose of at least 120 mg of oral elemental iron for all IDA mothers			
		IDA counselling done by nurse / MO according to standardized anemia counselling checklist			
		To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks			
		Severe Anemia (Hb< 7 and/ or symptomatic anemia) to be referred immediately to O&G team			
7.	Ptn Reassessment in 2/52	All IDA mothers to be seen in 2/52 by MO to review repeat FBC & iron studies			
		Compliance check and optimization of oral iron therapy			
		Referral for Parenteral iron (Intolerant to oral iron/ non compliance/no improvement in Hb in patients after first trimester)			
8.	Refer FMS if Hb <11	All mothers who still have IDA despite optimization of treatment to be discussed with Family Medicine Specialist for further Management			

IDA Quality Audit Form

3. Data collected in spreadsheet and important task managed through digital work station



Remedial Cycle 2 – Strategies for Change

STRATEGY 8 : Inhouse Parenteral iron Therapy Guideline

SIQ: Delayed referral for Parenteral Iron

PRE REMEDIAL :

- *No early identification* of cases indicated for parenteral iron
- Medical officers *lack confidence or unsure criteria* to refer for parenteral iron

POST REMEDIAL:

1. Development of Inhouse Parenteral Iron Therapy Guideline

Parenteral Iron Therapy Guideline in
Klinik Kesihatan Sungai Acheh

Parenteral Iron Therapy can be considered for patients with a CONFIRMED diagnosis of IDA

Indications for Parenteral Iron to be considered:
1.Non compliance or poor tolerance to oral iron or if response is poor (i.e. <1 g/L in 2 weeks or <2 g/L in 4 weeks)
2.Late booking
3.Hb not improving in late gestation >34 weeks
4.Asymptomatic Severe Anemia Hb < 7

Contraindications
1. First Trimester
2. Iron overload
3. Hypersensivity to parenteral iron

IV Venofer Protocol

Calculation of required dose:

Iron Sucrose (Venofer) 1 vial = 100 mg/ 5 ml

Total iron requirement (mg) = [Body weight (kg) x (Target Hb - Actual Hb)(g/dL) x 2.4] + 500

= [(_____kg) x (_____ - _____ g/dL) x 2.4] + 500
= _____ mg

DILUTION METHOD

DRIP INFUSION METHOD (MAX: 7mg/kg up to 500mg/week)

1.First Time Infusion

Test dose : Given IV (First Time only)
Dilute 1 ml (20 mg) in 20 ml NS and given over 15 minutes
If no adverse reaction for 30 minutes, then to proceed as below:

Dilute remaining 4 ml + new vial (Total 9 ml) in 200 ml NS and give over 30 mins at infusion rate of 400mls/hr.

2. Subsequent Infusion:

Subsequent Dose : Dilute 200 mg (10ml) in 200 ml NS and give over 30 min EOD until total dose completed.

MONITORING OF PATIENT ON IV VENOFER PROTOCOL

Monitoring done every 15 mins for first hour, then hourly.

Time	BP	PR	Temp	Spo2	Signature
Test dose 0 min (baseline)					
15 min					
30 min					
45 min					
60 min					
2nd hour					
3rd hour					

ADVERSE REACTIONS

1.Anaphylactic Reactions 2. Skin: itching, urticaria, angioedema 3. Cardiovascular: chest pain, hypotension, tachycardia, collapse 4. Respiratory: cough, shortness of breath, ronchi, stridor 5. Gastrointestinal: nausea, vomiting, diarrhoea, abdominal pain

CONSENT FORM

Administration of Intravenous Venofer

Name : _____ Date : _____
NRIC: _____ Booking weight : _____
Current Hb : _____ Serum Ferritin : _____

Borang Persetujuan Pesakit Untuk Intravena Venofer / Haemofer

Saya _____
No KP _____
Telah diberi penerangan yang jelas oleh doktor/ jururawat berkaitan kebaikan menerima rawatan intravena Venofer / Heamofer.

Saya faham bahawa:
☐ Prosedur ini adalah sebagai kaedah rawatan anemia disebabkan kekurangan zat besi.
☐ Prosedur ini mungkin perlu dilakukan beberapa kali berdasarkan pengiraan dos keperluan.
☐ Kesan sampingan berikut mungkin boleh berlaku :

- Reaksi anafilaxis (sangat jarang)
- Pengeluaran cecair dari picagari yang boleh menyebabkan kulit menjadi gelap
- Reaksi kulit – kemerahan, kegatalan, ruam
- Sakit kepala/ pening, loya, muntah, sembelit, denyutan nadi laju

Saya mengaku bahawa saya faham dengan jelas penerangan yang diberikan dan saya bersetuju untuk prosedur ini.

Tandatangan _____ Nama doktor _____
Tarikh _____ No KP _____
Tandatangan _____
Tarikh _____

2. CME and training on parenteral iron therapy

Ensure Medical Officer understands indication for parenteral iron and improve confidence to refer when indicated.

3. Initiation of Inhouse Parenteral Iron Therapy

Important milestone in patient care !

First inhouse parenteral iron therapy initiated successfully
Patients no longer need to travel to tertiary centre 40 km away.

Conformation to Model of Good Care (MOGC)

Process	Criteria	Standard	Pre Remedial Feb 2023	Post Cycle 1 July 2023	Post Cycle 2 Dec 2023
1. Standardized IDA Counselling	QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis	100%	0%	35%	↑ 58.3%
	IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	100%	0%	38.3%	↑ 48.3%
2.IDA Management Protocol	Medical Officer to order appropriate investigations for IDA- Suspected IDA Hb <11 with Microcytic Hypochromic Picture - Serum Feritin/ Iron Studies **Suspected Other Causes-** Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout	100%	53.3%	65%	↑ 78.3%
	To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	100%	43.3%	66.6%	↑ 71.6%
	To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	80%	46.6%	51.6%	↑ 58.3%
	Appropriate Referral for Parenteral Iron	100%	42.8%	50%	↑ 66.6%
	Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	80%	37.5%	42.8%	↑ 60%
3.Compliance Check and Optimization of Haematenics	Compliance check and optimization of Haematenics	100%	30%	60%	70%
	Assessment of patient awareness of IDA in pregnancy - Able to correctly answer at least *3 out of 4 components* (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics)	80%	8.3%	28.3%	46.6%

Remedial Cycle 3 - Strategies For Change

Dec 2023-Feb 2024

Remedial Cycle 3 – Strategies for Change

STRATEGY 9 :Expanding QA to Community

SIQ: Lack of awareness of IDA

Interventions during local community events

- ✓ IDA Awareness Videographic creation and promotion
- ✓ Activities such as quiz and cooking competition

Aim : 1. Improve *community awareness* on IDA in pregnancy
2. Promotion of *high iron diet and early booking*

IDA Awareness Videographic

Infografik Pra Perkahwinan : Anemia Waktu Mengandung

WHY ? Community-based nutritional education can result in a significant change in knowledge, attitude, and compliance towards iron supplementation among pregnant women

Abdisa et al.,2023

IDA promotion activities at local community events

- Karnival Sihat Cergas by Panel Penasihat Klinik ***(involve local community leader)***
- Go green @ Kebunity ***(local agriculture programme)***
- KOSPEN
- NHSI Screening

Remedial Cycle 3 – Strategies for Change

STRATEGY 10 : Digital Information Pamphlets

SIQ :Poor Compliance to Haematenics

PRE REMEDIAL :

- Compliance to Haematenic is still poor
- Side Effects not Commonly addressed

POST REMEDIAL :

✓ ***Intervention in collaboration with Pharmacy Unit***

✓ Innovative way to improve patient understanding on haematenic

What are the important points addressed?

- How to overcome the side effects associated with haematenic

- Perceptions such *as haematenic may cause big baby and haematenic is not needed if mother consumes high iron diet*

KENALI UBAT ANDA:
PIL HAEMATENIC

Kenali Ubat Anda: Pil Haematenik

Kenali Ubat Anda: Pil Haematenik

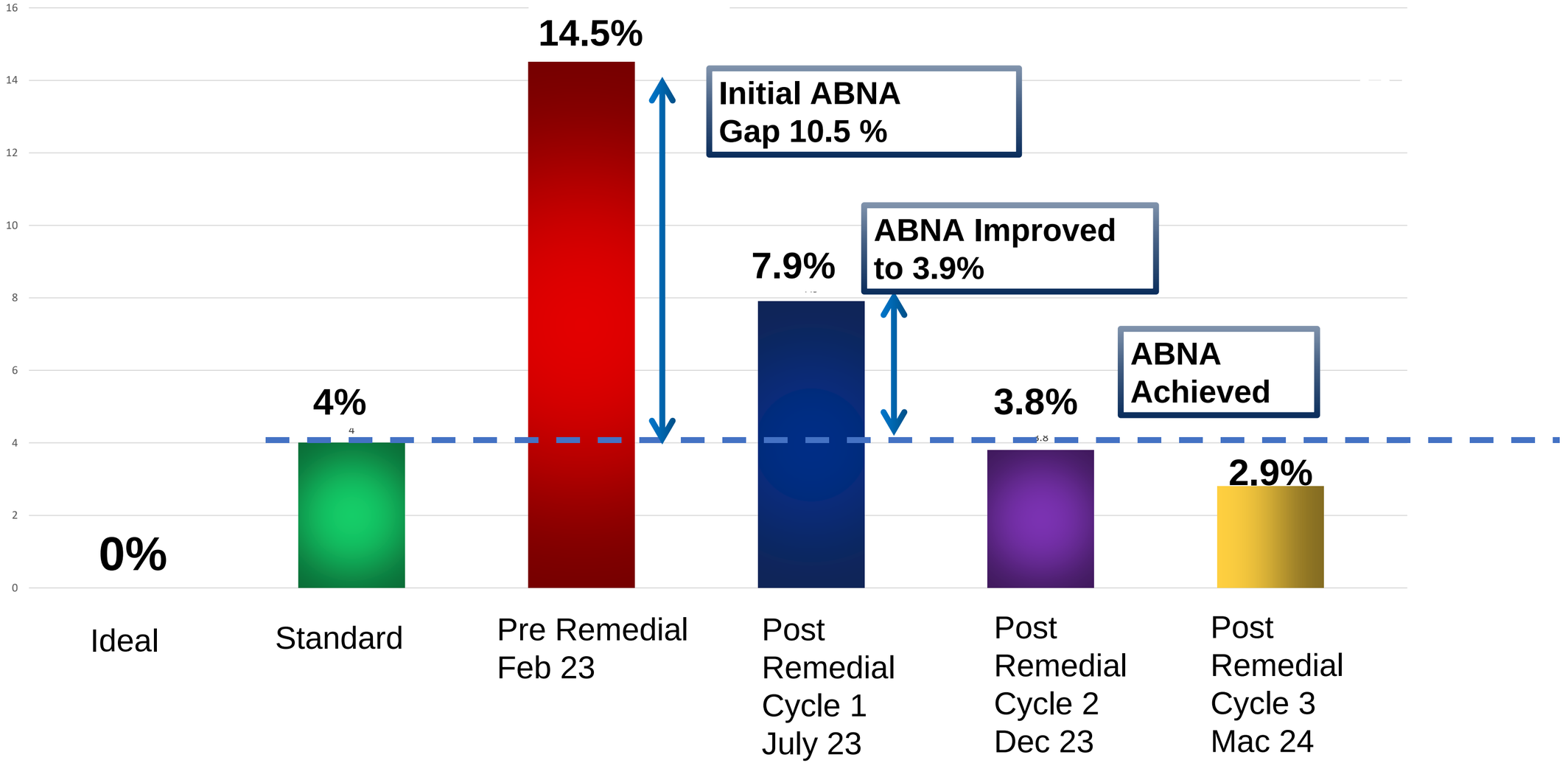
Kenali Ubat Anda: Pil Haematenik

Kenali Ubat Anda: Pil Haematenik

Effects of Change :Conformation to Model of Good Care (MOGC)

Process	Criteria	Standard	Pre Remedial Feb 2023	Post Cycle 1 July 2023	Post Cycle 2 Dec 2023	Post Cycle 3 Mac 2024
1. Standardized IDA Counselling	QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis	100%	0%	35%	58.3%	80%
	IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	100%	0%	38.3%	48.3%	78.3%
2.IDA Management Protocol	Medical Officer to order appropriate investigations for IDA- **Suspected IDA Hb <11 with Microcytic Hypochromic Picture** Serum Feritin/ Iron Studies **Suspected Other Causes-** Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout	100%	53.3%	65%	78.3%	83.3%
	To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	100%	43.3%	66.6%	71.6%	91.6%
	To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	80%	46.6%	51.6%	58.3%	75%
	Appropriate Referral for Parenteral Iron	100%	42.8%	50%	66.6%	100%
	Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	80%	37.5%	42.8%	60%	78.3%
3.Compliance Check and Optimization of Haematenics	Compliance check and optimization of Haematenics	100%	30%	60%	70%	88.3
	Assessment of patient awareness of IDA in pregnancy - Able to correctly answer at least *3 out of 4 components* (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics	80%	8.3%	28.3%	46.6%	73.3

Effects of Change : Performance of Study Indicator
Achievable Benefit Not Achieved (ABNA)



Effects of Change : Impact of Study on Clinical Outcomes

Clinical Outcome	Pre Remedial	Post Remedial Cycle 3
Total IDA cases	**16**	***2***
Cases requiring maternal blood transfusion	**5**	***0***
IDA associated stillbirth	**2**	***0***

Effects of Change : Impact of Study on Cost Saving Measures

Pre Remedial	Cost	Post Remedial Cycle 3	Cost
Total No of Patients refered for Blood tx due to Severe / Symptomatic Anemia: **2** (Total 4 pint Packed Cell tx)	**Cost of 1 pint Packed Cell : RM 500** ***Total Cost: 500x 5*** ***: RM 2500*** (Implementing Patient Blood Management in Hospitals Across Malaysia Jan 2019)	**Total No of Patients refered for Blood tx due to Severe / Symptomatic Anemia**: **0**	***Cost : RM 0***
Total No of patients referred for IV Venofer: **1** (Estimate 500mg / ptn elemental iron required to raise Hb by 2)	**Estimate 500 mg/ptn x1 : 500 mg** **Cost of IV Venofer : RM 32/ 5 ampoules** (RM 6.4 pe ***Total Cost***	**Total No of patients referred for IV Venofer: 5**	**Estimate 500 mg/ptn x5 : 2500 mg** Cost of IV Venofer :RM 32/ 5 ampoules
Printing of counselling and health promotion material for IDA in pregnancy	Estimate c Banners: RM 650	health promotion material for IDA in pregnancy	**Digital Information Pamphlet** **Total Cost : 0**
Pre Remedial Total Cost : RM3182		**Post Remedial Cycle 3 Total Cost : RM 160**	

Estimated Total Cost Saved: RM 3022

Effects of Change : Impact of Study on Time Saving Measures

Pre Remedial	Time	Post Cycle 2	Time
Time taken to counsel for IDA by Nurses per patient (verbal/pamphlet etc)	**Estimate 20-30 Minutes**	**Time taken to counsel for IDA by Nurses per patient**	**Estimate 10-15 mins using Digital Counselling Tools**
Time taken to counsel/ review for IDA Medical Officer per patient (verbal/pamphlet etc)			

Estimated 10 minutes saved per patient (Average of 2.5 hours saved /day)

Effects of Change : Impact of Study on Patient Experience and Workflow Process

Client Satisfaction Survey Form with Digital Counselling Tool

Assessibility and Easy to Use : **78% YES**

Improved Understanding on IDA : **84% YES**

Conducted among 30 pregnant patients attending MCH unit

Satisfaction Survey Form with IDA Management Tools among healthcare workers

Assessibility and Easy to Use : **91% YES**

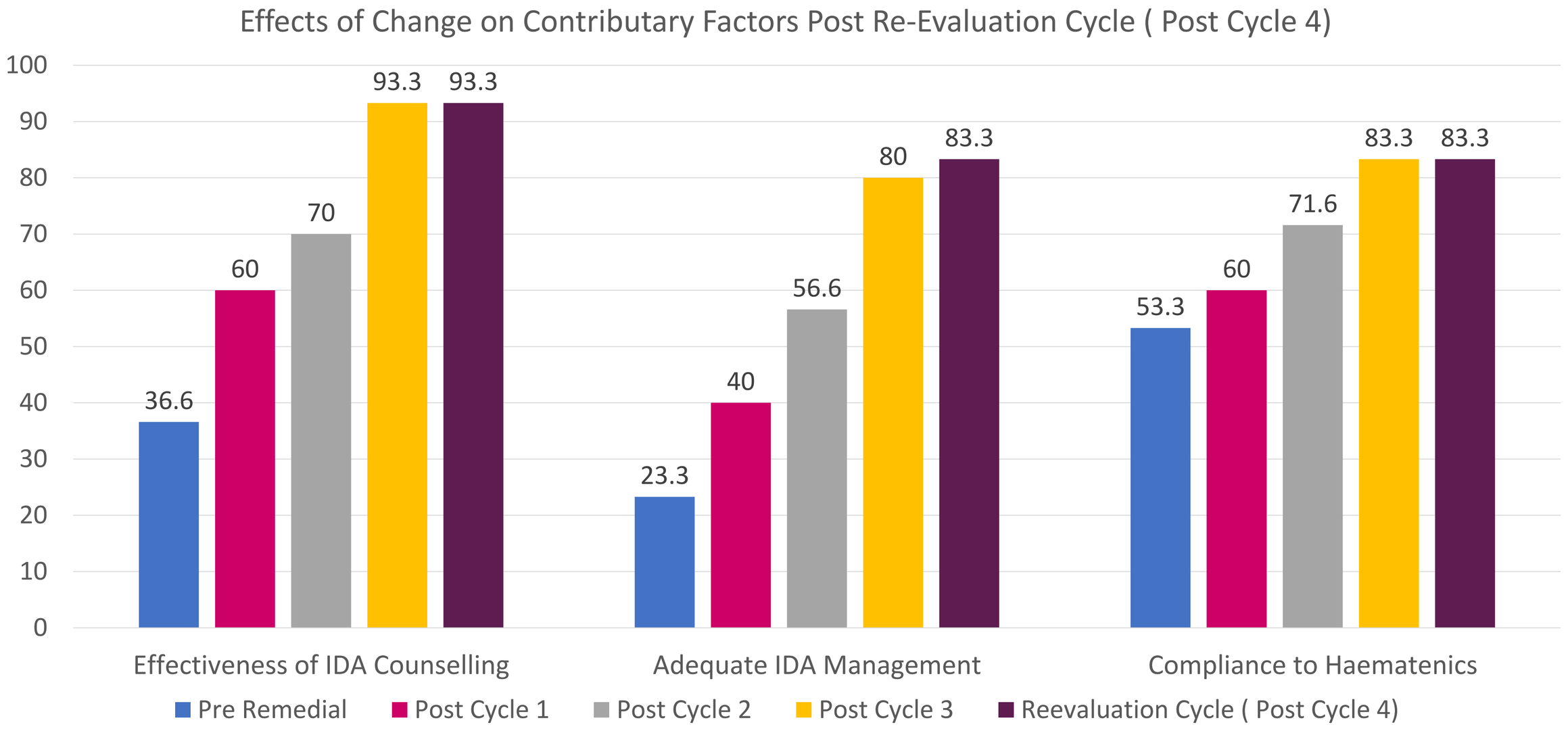
Ease of Workflow Process : **83% YES**

Conducted among 20 nurses and 10 Medical Officers in KKSA

Ensuring Sustainability : Conformation To MOGC (Reevaluation Cycle)

Process	Critical Step	Standard	Pre Remedial Nov 2022	Post Cycle 1 July 2023	Post Cycle 2 Dec 2023	Post Cycle 3 Mac 2024	Post Cycle 4 Aug 2024
1. Standardized IDA Counselling	QR Scan For Digital Counselling Tool for all patients at booking and upon IDA diagnosis	100%	0%	35%	58.3%	80%	91.3%
	IDA counselling done by nurses according to Standardized IDA Counselling Protocol for all patients	100%	0%	38.3%	48.3%	78.3%	88.3%
2.IDA Management Protocol	Medical Officer to order appropriate investigations for IDA- **Suspected IDA Hb <11 with Microcytic Hypochromic Picture -** Serum Feritin/ Iron Studies **Suspected Other Causes-** Hb/DNA Analysis / Peripheral Blood Smear/ Vitamin B12 and Folate levels/ Stool Ova Cyst/ PTB Workout	100%	53.3%	65%	78.3%	83.3%	83.3 %
	To prescribe daily dose 120-200 mg of oral elemental iron for all IDA mothers	100%	43.3%	66.6%	71.6%	91.6%	100%
	To refer Nutritionist for Iron Rich Diet Counselling date within 2 weeks	80%	46.6%	51.6%	58.3%	75%	80%
	Appropriate Referral for Parenteral Iron	100%	42.8%	50%	66.6%	100%	100%
	Referral to Family Medicine Specialist for further management if Hb still not improving despite optimization of management by Medical Officer	80%	37.5%	42.8%	60%	78.3%	81.6%
3.Compliance Check and Optimization of Haematenics	Compliance check and optimization of Haematenics	100%	30%	60%	70%	88.3	96.67%
	Assessment of patient awareness of IDA in pregnancy - Able to correctly answer at least *3 out of 4 components* (75%) in IDA awareness questionnaire- High Iron Diet, IDA Complications,Accurate Consumption of Haematenics and Perception of Haematenics)	80%	8.3%	28.3%	46.6%	73.3	76.6%

Ensuring Sustainability **:** ***Effects of Change*** **on Contributary Factors**



CONCLUSION

OBJECTIVE	CONCLUSION	
To verify the Prevalence of IDA in pregnancy In KKSA	Pre Remedial Data showed ***high percentage of IDA in KKSA at 14.5 %*** compared to *4.3 %* in Penang State and *3.3 %* in PKD SPS district.	
To Identify The Contributing Factors of High Prevalence of IDA in pregnancy In KKSA	**The possible attributing factors to high percentage of IDA include:** *1. Ineffective IDA Counselling* *2. Inadequate Management of IDA and* *3. Poor Compliance to Haematenics*	
To recommend and implement remedial measures based on findings	**Multiple Remedial measures implemented across 3 cycles to:** 1. Improve effectiveness of *IDA Counselling* *2. Optimize IDA in pregnancy Management* *3. Increase patient compliance to haematenics.*	
To reevaluate the effectiveness of actions taken	***Performance Of Study Indicator***	*Reduced from **14.5%** to **2.9 %** (Post Remedial Cycle 3)*
	ABNA	*Reduced from **10.5** to below **0** post 3rd cycle*
	Contributing Factors	*Effectiveness of IDA Counselling **36.5%** to **93.3%*** *Adequateness of IDA Management **23.3%** to **80%*** *Compliance to Haematenics **53.3** to **83.3%***
	Impact Of Study	***0** Cases of blood transfusion* ***0** Cases IDA associated stillbirths* *Total cost **RM 3022** saved* *Total 10 minutes saved per patient consultation*

Lessons that we learnt along the way

1.	**Limitation of the Study**	Poor socioeconomic status of patients *may limit their assess to healthy, iron rich diet .* Lack of smartphone/ data may limit assess *to digital counselling tools*
2.	**Other lessons**	Patients in adolescent age and premarital conception present in late gestation with low iron levels - ***role for education at secondary school level for IDA awareness***. Patient education in *local language and familiar setting as well as patient empowerment* is vital in *improving health seeking behaviour.*

A dynamic combination of improved work process, patient education and empowerment as well as digital collaboration achieved significant improvement in patient care and clinical outcomes.

The Next Steps

Expansion of Project to all 6 Health Clinics in Seberang Perai Selatan district

Inaugural Meeting and official launching Of QA Project in SPS district

QA project ongoing in all 6 health clinics in PKD SPS

IDA Management Tools

Recreation of Digital Counselling Tool in Mandarin and Tamil

- ***Launched at all health clinics in SPS district and to expand to other districts in Penang state.***

妊娠期贫血

IDA Digital Counselling Tool- Mandarin

கர்ப்ப காலத்தில் இரத்த சோகை

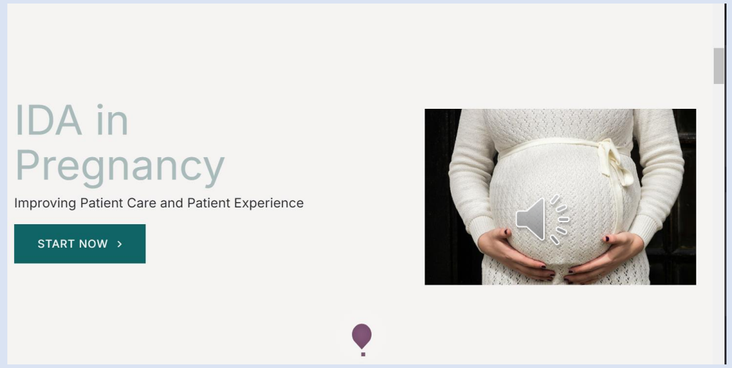
IDA Digital Counselling Tool- Tamil

Further Collaborations with other agents

- **Local peer Breastfeeding group - *Persatuan Penyusuan Susu Ibu Pulau Pinang***
- **Education to school students in collaboration with *District Education Office, Ministry of Education***

IDA Digital Application

- **A digital mobile application on anemia in pregnancy is also underway with aim *on improving IDA awareness and management.***



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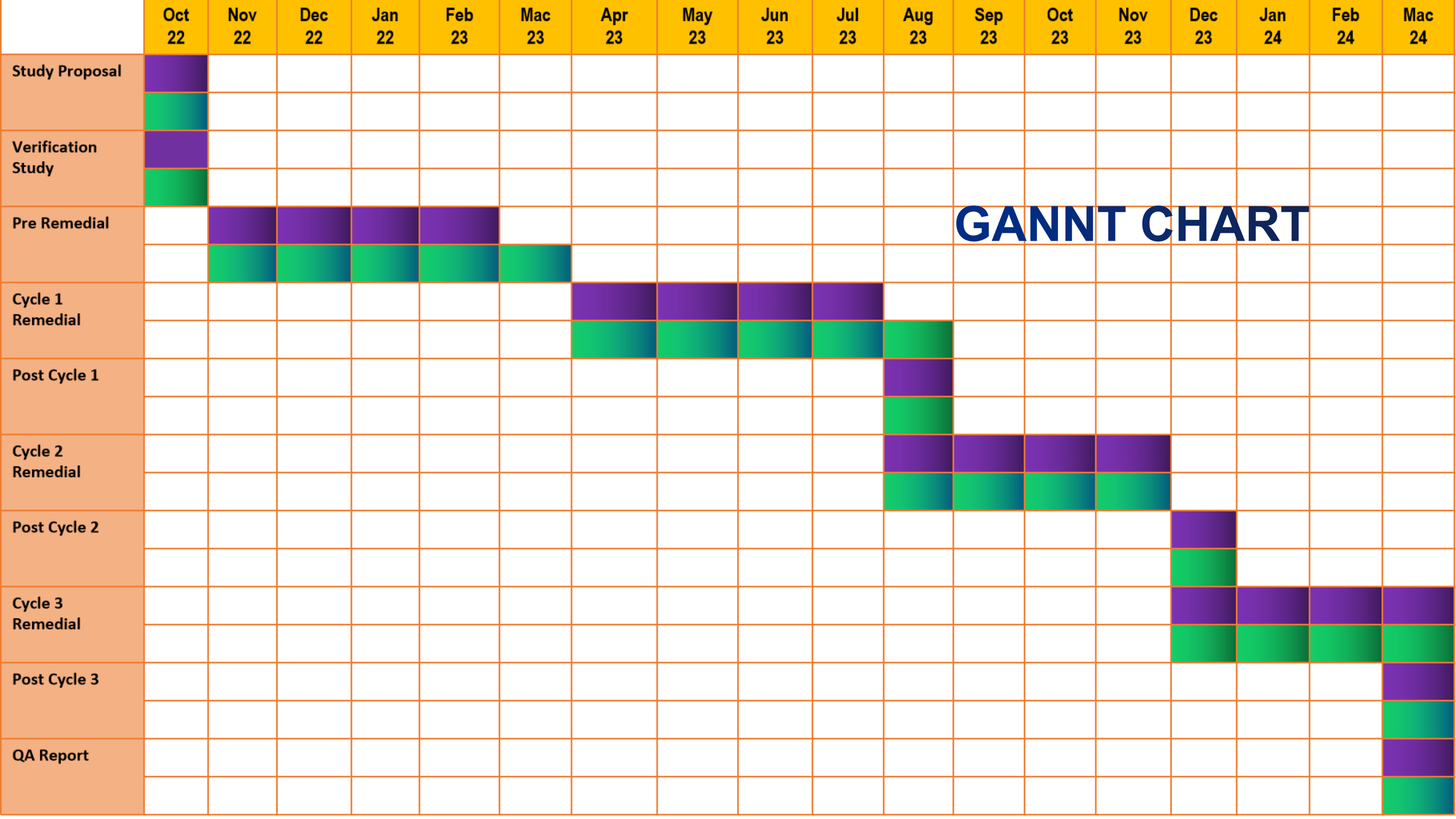
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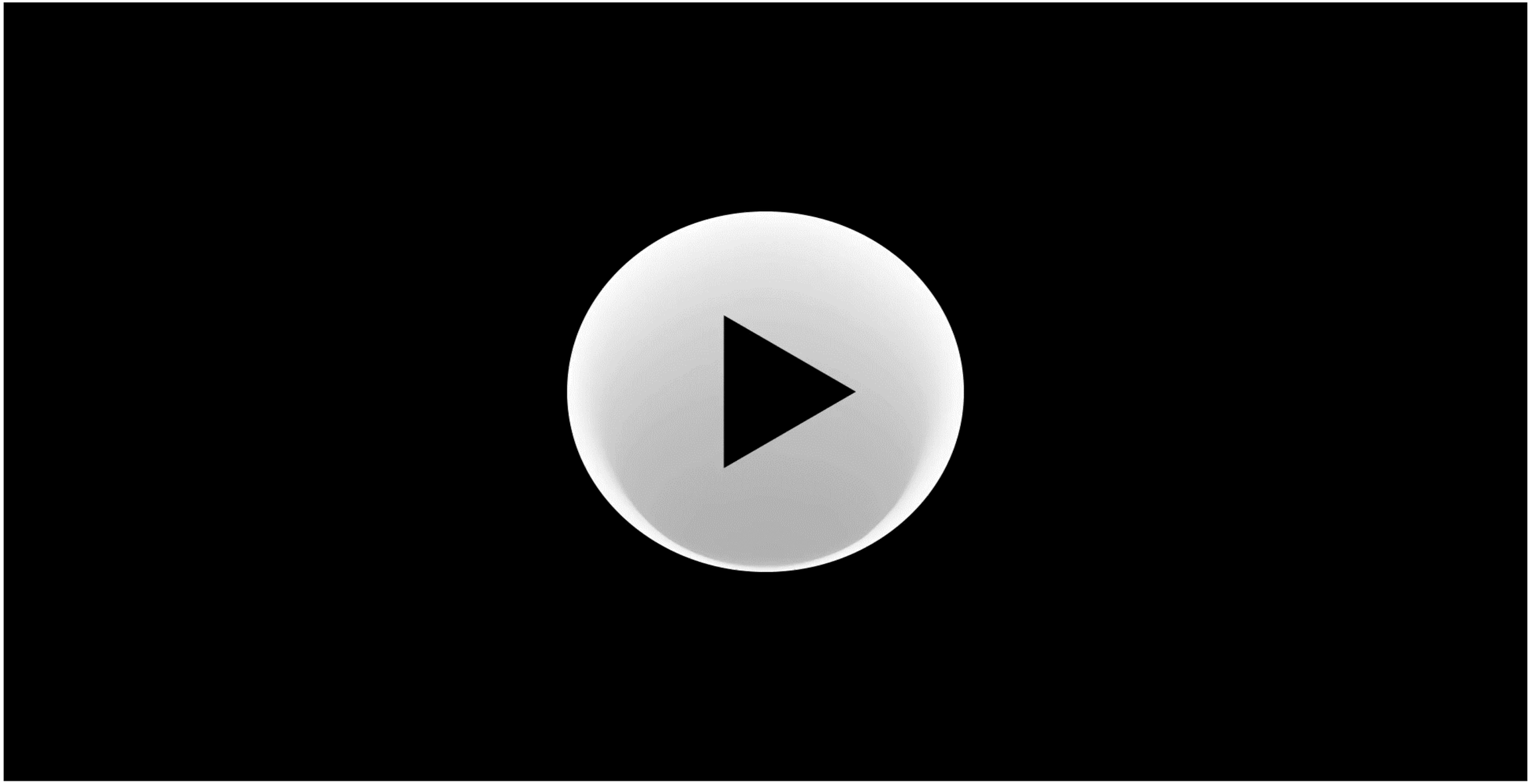
Jan 24
Feb 24
Mac 24
Study Proposal
Verification Study
Pre Remedial
Cycle 1 Remedial
Post Cycle 1
Cycle 2 Remedial
Post Cycle 2
Cycle 3 Remedial
Post Cycle 3
QA Report

Summary of Data collected

Year/ Cycle	Total no of IDA Cases	Total No of patients (Sample Size)	Percentage of IDA
Pre Remedial Dec 2022- Mac 2023	16	110	14.5
Post Cycle 1 Apr- July 2023	5	66	7.9
Post Cycle 2 Aug - Nov 2023	3	77	3.8
Post Cycle 3 Dec 2023 - Mac 2024	2	69	2.9
Revaluation Cycle (Post Cycle 4) – Apr – Jul 2024	2	81	2.4



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