

**Universiti
Putra
Malaysia**



A web/smartphone-based lifestyle program for the prevention of gestational diabetes mellitus (GDM) in Malaysia: Optimizing gestational weight gain (GWG)

3 GOOD HEALTH
AND WELL-BEING



PRESENTATION OUTLINE

01 Introduction

02 Project Background


- **Phase 1 – Development of materials**
- **Phase 2 – Training of health professionals**
- **Phase 3 – Implementation of lifestyle program**

01

INTRODUCTION



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PERTANIAN • INOVASI • KEHIDUPAN
BERILMU BERBAKTI
WITH KNOWLEDGE WE SERVE

Hyperglycaemia in Pregnancy (HIP)

- ❑ **Pre-gestational diabetes**
- ❑ **Gestational diabetes mellitus (GDM)**
- ❑ **Diabetes in pregnancy (DIP)**

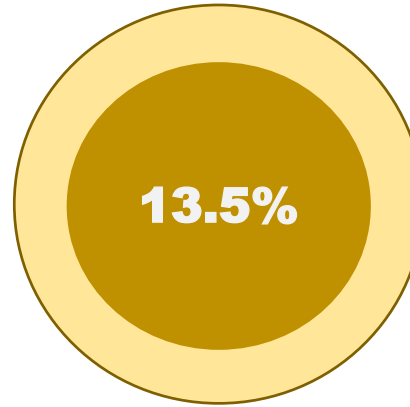
- **Estimated 21.1 million (16.7%) of live births to women had some forms of HIP**
 - ✓ Proportion of HIP cases due to GDM is 80.3%
 - ✓ Most (87.5%) HIP cases are in low- and middle-income countries
- **Age-adjusted (20-49 years) prevalence of HIP**
 - ✓ SEA region (highest) – 28.0%; WP region – 14.0%
 - ✓ Under age 30 years (due to higher fertility rates) – 46.3%
- **Prevalence of GDM (20 – 30 years old)**
 - ✓ Global – 14.0%
 - ✓ MENA region (highest) – 27.6%; WP region – 14.7%

(International Diabetes Federation, 2022; Wang et al., 2022)

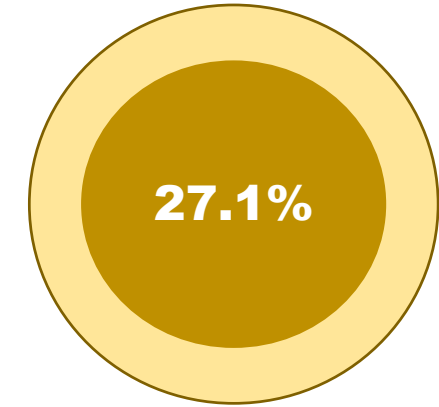
NATIONAL HEALTH & MORBIDITY SURVEY

(Hyperglycaemia in Pregnancy)

2016

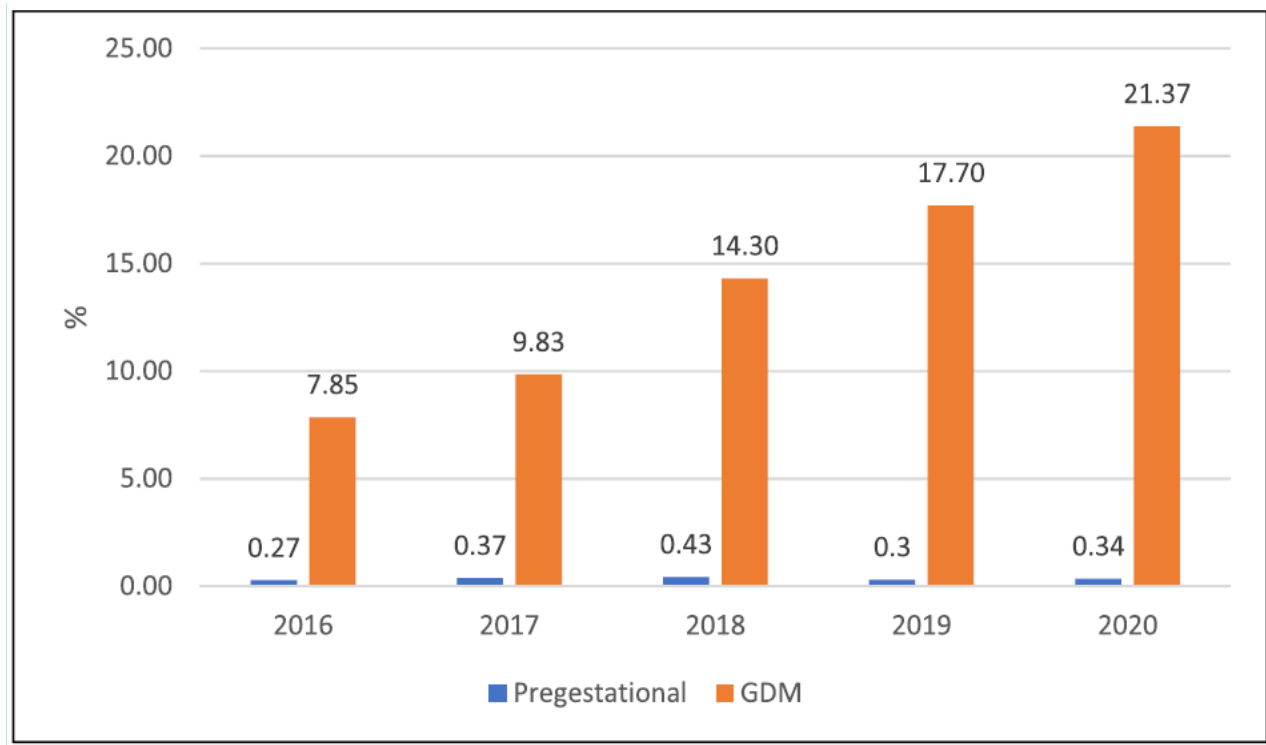


2022



NATIONAL OBSTETRICS REGISTRY (2018-2020)

(Pre-gestational Diabetes & GDM)



- **GWG is an important determinant of short- and long-term health outcomes for the mother and offspring**
 - **Excessive / inadequate GWG and pre-pregnancy BMI are associated with adverse pregnancy outcomes**
 - ✓ *low birthweight, SGA, LGA, macrosomia, stillbirth, caesarean birth, pre-term delivery, GDM, preeclampsia, post-partum hemorrhage, post-partum weight retention and offspring obesity*
 - **Independent effect of GWG and pre-pregnancy BMI or combination of both**
- **Structured diet and physical activity-based lifestyle interventions are associated with reduced GWG and lower risk of adverse pregnancy outcomes**

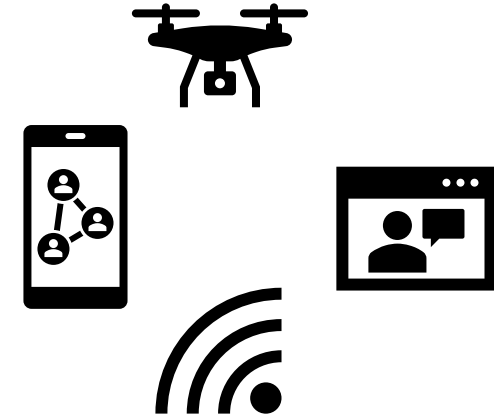
(Teede et al., 2022; Choi et al., 2022; Voerman et al., 2019)

- **Digital application is a technology that provides access to information and social support via mobile apps, portals, websites, software and other internet-based programs**
- **Digital health-related applications and web-based digital tools can manage all forms of diabetes, particularly GDM**
 - **Pregnant women manage diet, track physical activity and conduct self-monitoring routines such as weight monitoring and glucose reading**
 - **Reduced diabetic clinic visits and lower blood glucose level**

(Morris et al., 2023; Leblalta et al., 2022; Chan & Chen, 2019)



+



Community-based platforms remain as an effective approach

- **Nutrition education / nutrition counseling / psychosocial interventions**
- Home visits / clinic setting
- Community health workers / Peer counsellors / Mother peer groups

Utilization of mass-media and mobile technology

- **Reach target groups**
- Support front-line workers


(Lancet Series, 2020)

02

PROJECT BACKGROUND



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UPM – MOH Collaborative Project: Optimizing Gestational Weight Gain (GWG) for Prevention of Gestational Diabetes Mellitus (GDM) in Malaysia



IBU SIHAT

“Ibu sihat, generasi sihat”

Project Partners



WDF



UPM



MOH



UKM



USM



UiTM



UCSI University

Project Phases



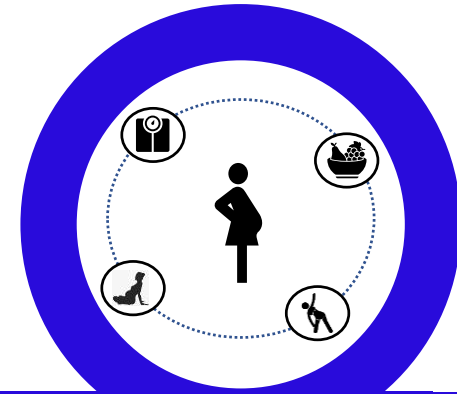
Phase 1

Development of materials
(Website / Apps – Health and
nutrition education (HNE)
resources, gestational weight
gain, dietary intake, data
collection)



Phase 2

Training of nutritionists and
nurses



Phase 3

Project implementation
(Pilot study)





PHASE 01

DEVELOPMENT OF MATERIALS





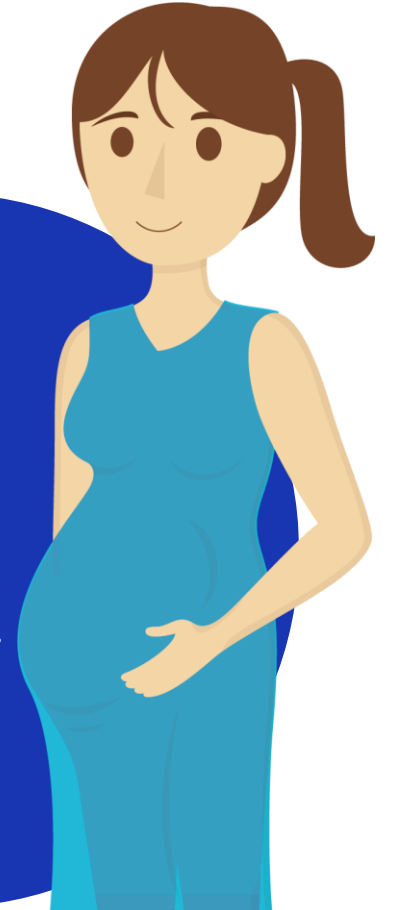
For Health Professionals

- 4 key topics
- 32 sub-topics
- Reviewed by 2 experts

Health and Nutrition Education Resources

For Pregnant Women

- 4 key topics
- 32 sub-topics
- Pre-tested on pregnant and non-pregnant women



HNE Resources for Health Professionals



**PENGURUSAN
PENINGKATAN
BERAT BADAN
SEMASA KEHAMILAN**

PENYUNTING
Zalilah Mohd Shariff
Chan Yoke Mun



TOPIK

**PENINGKATAN
BERAT BADAN
SEMASA
KEHAMILAN**

Peningkatan berat badan semasa kehamilan mengikut saranan adalah penting bagi memastikan kesihatan wanita hamil dan bayi yang dilahirkan.



TOPIK

**PEMAKANAN
SEMASA
KEHAMILAN**

Pemberian pendidikan pemakanan seawal kehamilan dan dorongan untuk mengamalkan diet sihat serta kekal aktif sepanjang kehamilan adalah khidmat nasihat yang boleh diberikan oleh anggota kesihatan kepada wanita hamil.



TOPIK

**AKTIVITI
FIZIKAL
SEMASA
KEHAMILAN**

Senaman merupakan aktiviti fizikal yang penting untuk membantu meningkatkan stamina wanita hamil dan mengekalkan tahap kesihatan.



TOPIK

**KESIHATAN
PSIKOSOSIAL
SEMASA
KEHAMILAN**

Penjagaan psikososial yang berkesan boleh membantu dalam pengurusan peningkatan badan semasa kehamilan.

HNE Resources for Pregnant Women



Peningkatan Berat Badan

6 sub-topics



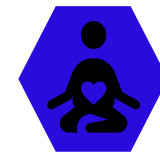
Pemakanan

11 sub-topics



Aktiviti Fizikal

12 sub-topics

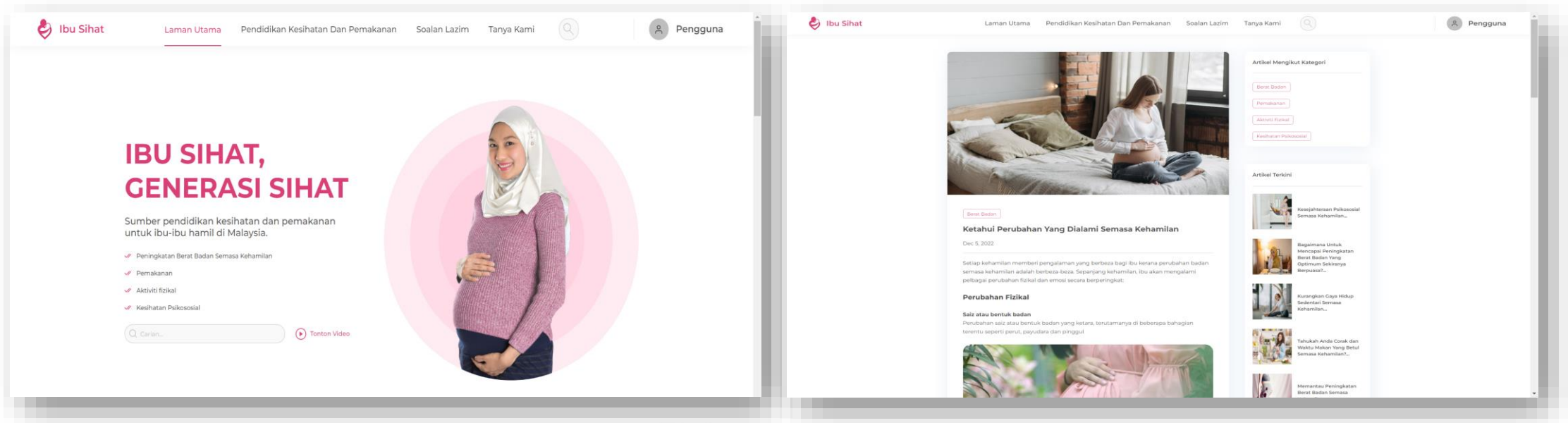


Kesihatan Psikososial

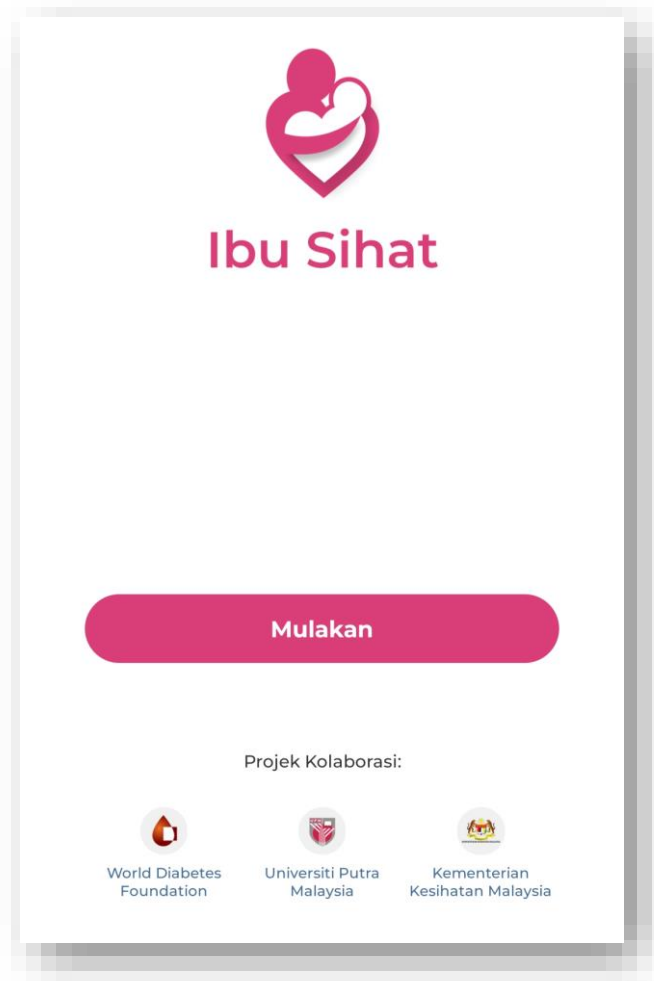
3 sub-topics

Ibu Sihat Website

- Website link: <https://www.ibusihat.my/>
- Can be accessed via Ibu Sihat Application through Health and Nutrition Education icon.
- Consists of 32 subtopics (4 main topics) – article articles, infographics and videos.
- Additional features – Soalan Lazim (Frequently Asked Questions) and Tanya Kami (Ask Us).



Ibu Sihat Application



Consists of 4 main apps:



GWG App
(Gestational Weight Gain)



Diet App



Health and
Nutrition Education



Data Collection
App



App – Gestational Weight Gain (GWG) Monitoring

Allows a pregnant woman to record her weight throughout pregnancy and receive real-time feedback in the form of graphical illustration and text on weight gain progress.



ONBOARDING

Step 2
Adakah ini kehamilan pertama?

☐ Ya

☐ Tidak

Anggaran tarikh kelahiran

Berat badan sebelum kehamilan (kg)

Tinggi (cm)

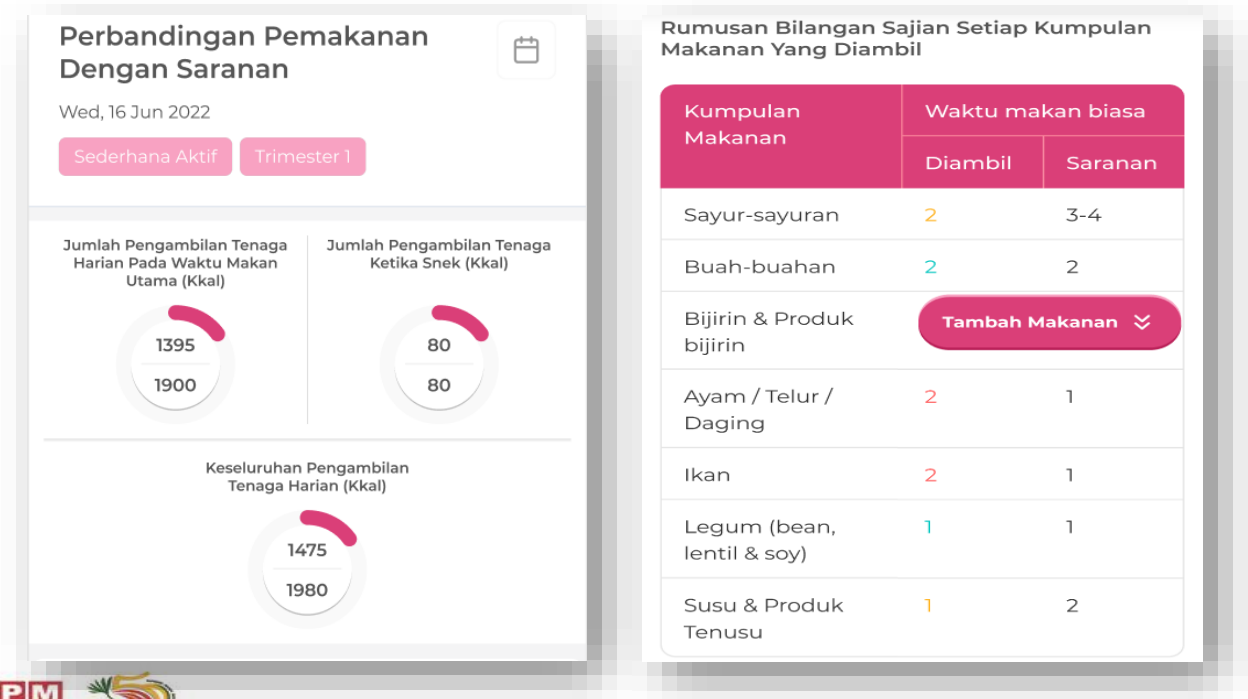
Hantar



App – Dietary Intake Monitoring

- Allows a pregnant woman to record her dietary intake throughout pregnancy and receive real-time feedback on her daily energy intake and number of servings for each food group.
- The feedback will be presented in a graph and in-text with a “traffic light”

Colour	Indicator
Red	Far from reaching recommendation
Yellow	Almost reaching the recommendation
Green	Reaching the recommendation



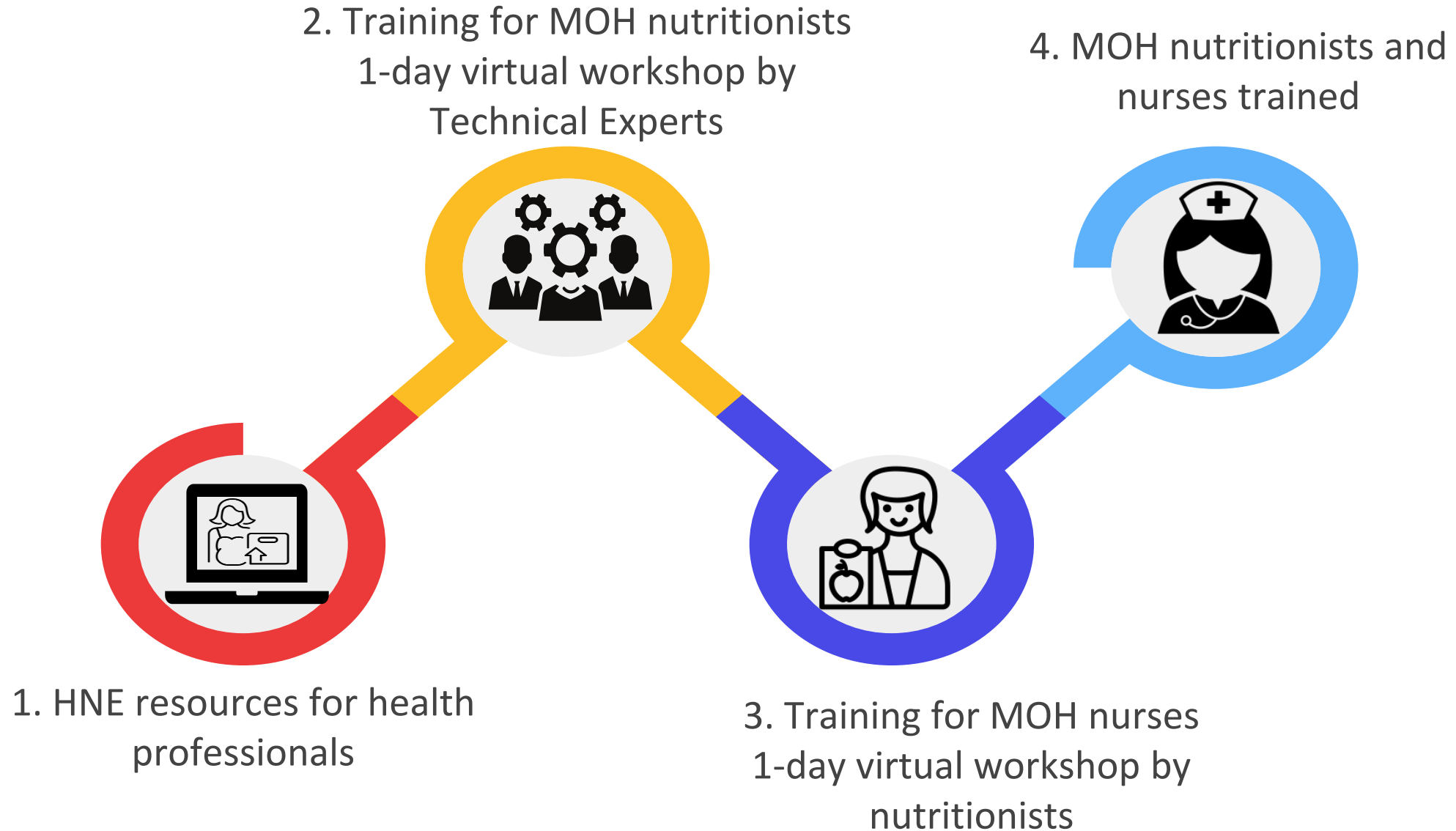


PHASE 02

TRAINING OF NUTRITIONISTS AND NURSES



Overview of Training





Training of Nutritionists



HOW

A day virtual workshop by Technical Experts

- *Content (Slide presentation and Q&A session)*
- *Activities (Case-studies and Interactive Quiz)*



WHO

State nutritionists of MOH (N=367)



WHEN

April 2022

- *4 sessions*



Training of Nurses



HOW

A day virtual/physical workshop by State nutritionists

- *Content (Slide presentation and Q&A session)*
- *Activities (Case-studies and Interactive Quiz)*



WHO

Nurses of MOH (N=15,096)

- *13 states and 3 federal territories*



WHEN

October 2022 – March 2023



PHASE 03

PROJECT IMPLEMENTATION



(PILOT STUDY)

General Objective

To determine the effectiveness of a web/smartphone-based lifestyle program on optimizing gestational weight gain (GWG) to prevent the incidence of gestational diabetes mellitus (GDM)

SELECTION OF STATES

- A total of nine (9) states are selected to represent the Northern, Southern, East Coast and Central region of Peninsular Malaysia

Northern

Penang

Kedah

Southern

Johor

Malacca

Negeri Sembilan

East Coast

Terengganu

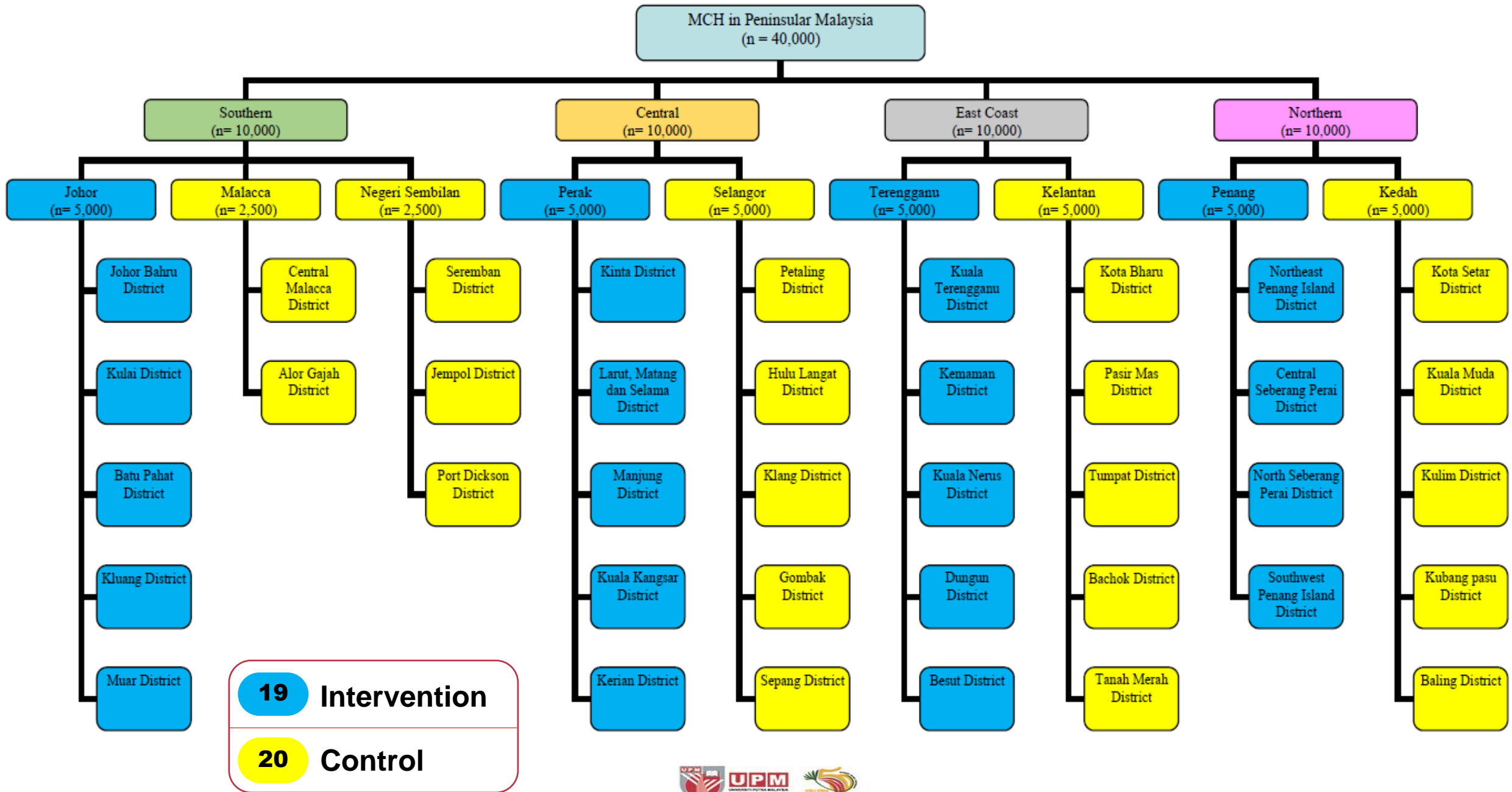
Kelantan

Central

Perak

Selangor

- States are randomly assigned as either intervention or control (wait list) group
- Selected MCH clinics in the top five highest populated districts of each state



SUMMARY OF SELECTED CLINICS

States	Number of clinics
Johor	22
Perak	23
Terengganu	23
Pulau Pinang	19
Total Clinics (Intervention)	87
Kedah	25
Kelantan	4
Melaka	10
Negeri Sembilan	12
Selangor	24
Total Clinics (Control)	75
Total Clinics	162



PARTICIPANTS

Pregnant women (in any trimester) attending antenatal care at health clinics of the Ministry of Health, Malaysia.



TREATMENT

Intervention

Control



MOH clinic antenatal care



Health and Nutrition Education (HNE) resources



Gestational Weight Gain (GWG) monitoring

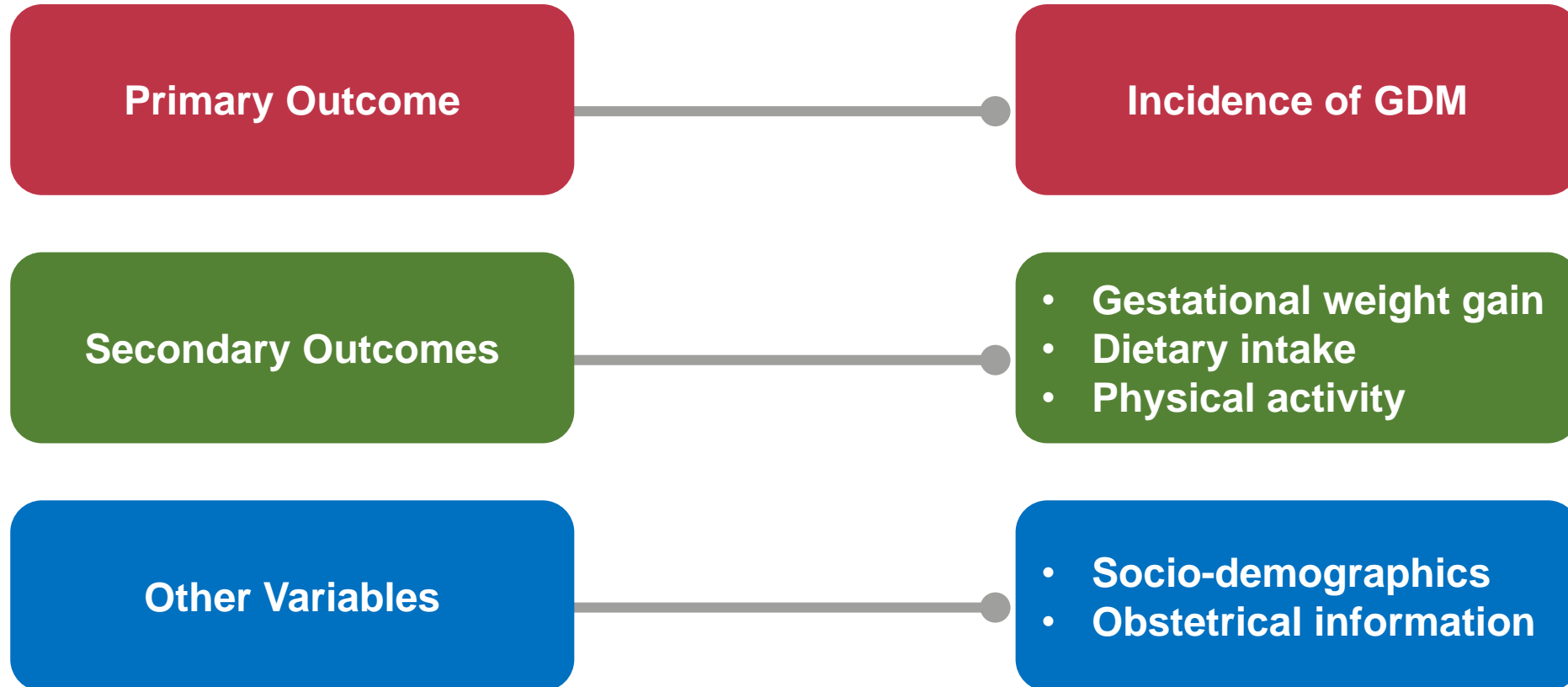


Dietary intake monitoring



Note – Control group will have access to all apps after June 2024

STUDY OUTCOMES



DATA COLLECTION



Pregnant women from intervention and control (wait list) groups will use 'Data Collection' app to report:

- **Socio-demographics**
- **Obstetrical information**
- **Glucose level**
- **Anthropometric measurements (at each trimester)**
- **Dietary intake (at each trimester)**
- **Physical activity (at each trimester)**

Instructions will be given to the women before they answer the questionnaires in the smartphone app

DATA COLLECTION TIME POINTS

No	Measurements	First registration	1 st Trimester	2 nd Trimester	3 rd Trimester
1	Socio-demographics	✓			
2	Obstetrical information	✓			
3	Glucose level - OGTT			✓	
4	Anthropometric measurements - Pre-pregnancy weight / BMI - Height - Weight	✓	✓	✓	✓
5	Dietary assessment - FFQ	✓	✓	✓	✓
6	Physical activity - PPAQ	✓	✓	✓	✓

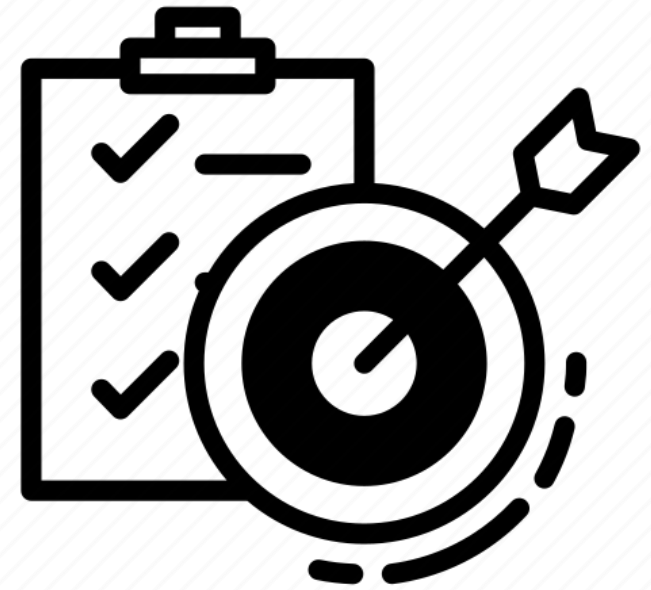
Project Execution

- ❖ **Start date:** May 2023
- ❖ **Recruitment of participants:** May-October 2023 (6 months)
- ❖ **Duration:** May 2023 - July 2024 (15 months)



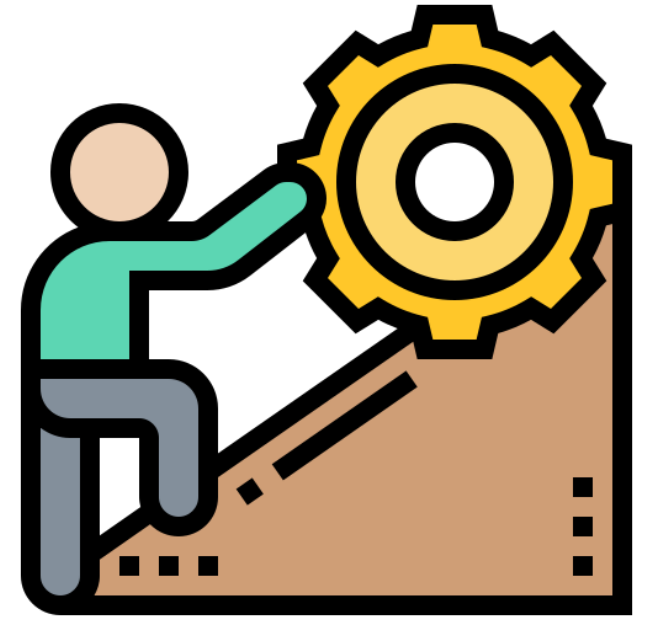
Achievements so far

- ✓ Support from the Ministry of Health
- ✓ Development of project materials and resources
- ✓ Online training of health professionals



Challenges to come

- ✓ Support at the clinic level in participant recruitment
- ✓ Participation of pregnant women
- ✓ Project materials (website / apps) may not meet the need of pregnant women
- ✓ Quality data for the study design



Acknowledgement:

Project Members

- ❖ Prof. Dr. Zalilah Mohd Shariff
- ❖ Prof. Dr. Chan Yoke Mun
- ❖ Dr. Yong Heng Yaw
- ❖ Ms. Najhah Mat Yunus
- ❖ Ms. Er Ying Ting
- ❖ Mr. Azrul Zafri Azuri

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- ❖ Funding Agency – World Diabetes Foundation
- ❖ Technical Experts – UPM, UKM, USM, UiTM, UCSI, MOH






THANK YOU

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