

Knowledge, Attitudes and Practices of antepartum care among pregnant mothers in Singapore

Megan Ruien Ling¹, Dr Hui Min Angela Ho², Associate Professor Manisha Mathur²

¹Yong Loo Lin School of Medicine, National University of Singapore, Department of Minimally Invasive Surgery, Division of Obstetrics and Gynaecology, K. K. Women’s and Children’s Hospital, Singapore

Introduction

- Pregnancy is a “**window to future future health**” – a formative experience and a woman's initial, prolonged interaction with the healthcare system.
- Complications in pregnancy are associated with higher future mortality. [1]
- **Antenatal education improves pregnancy outcomes** by increasing maternal self-efficacy, reducing fear and anxiety of labour, and improving delivery mode preferences. [2,3]
- While **general antenatal education** is **more effective** than specific topics, there are **no validated questionnaires** that reliably evaluate knowledge of general antepartum care. and **no such studies within the Southeast Asian setting**. [4,5]
- Within Singapore, **knowledge gaps have been identified** in specific topics, such as
 - folic acid and calcium supplementation, [6]
 - physical activity in pregnancy, and [7]
 - antenatal management of infectious diseases like COVID-19. [8]



Results

- The results are in the process of data collection and review.
- We expect overall understanding of antepartum and intrapartum care among pregnant mothers in Singapore to be good, but seek to **identify specific significant knowledge gaps**, and **correlate knowledge** to **attitudes and practices** surrounding their pregnancy.
- Knowledge gaps are likely to be present in pregnant women who are **nulliparous, of an earlier gestational age, younger, unmarried, and with a lower level of education**.
- We also hope to correlate the extent of knowledge to the **frequency, format and financial extent** to which each patient consults **alternative maternal education resources**, over and above their regular antenatal consultation.

Study Objectives

This study aims to assess the current knowledge, attitudes and practices (KAP) of antepartum and intrapartum care among pregnant mothers in Singapore and determine its association with sociodemographic factors.

Future plans

- Our study is the **first Southeast Asian Hospital-based study** that seeks to reliably quantify the general antepartum knowledge amongst pregnant mothers
- We hope to **validate** our adapted KAP questionnaire in other centres within Singapore, and subsequently internationally.
- With our results, we identified several **demographic subgroups** with poorer knowledge of antenatal care, who may **benefit from further educational intervention**.
- Future research may evaluate the **effectiveness** of such interventions with a **validated and standardized questionnaire**.

Materials and Methods

- The study has been reviewed and exempted by the SingHealth Centralised Institutional Review Board
- **Hospital-based cross-sectional study** with **convenience sampling** to maximise participation
- **Selection criteria:**
 - Pregnant women aged 18 and above
 - Presenting to the KK Women’s and Children’s hospital for regular antenatal review in outpatient clinics
- Patients will scan a QR code and fill out a questionnaire on their personal mobile devices on *FormSG*, a secure national mobile platform.
- The form includes
 - Sociodemographic details
 - Obstetrical history
 - Scored questionnaire, **adapted from the Knowledge, Attitudes and Practices (KAP) framework** to reflect Singaporean practices and contexts [9]
- We will construct **univariable logistic regression models** for the KAP Questionnaire scores to appreciate the overall understanding of antenatal care in Singapore.
- Selected variables will undergo a **multivariable logistic regression** in a forward stepwise manner, and a **subgroup analysis** based on the respective KAP domains

Knowledge, Attitudes and Practices of antepartum and intrapartum ca...

Personal Details

Please answer all of the following questions by ticking most appropriate box or filling the appropriate information

2. Age (in years)

3. Marital status

☐ Married

☐ Widowed

☐ Divorced

☐ Single

4. Ethnicity

☐ Chinese

☐ Malay

Knowledge, Attitudes and Practices of antepartum and intrapartum ca...

Details about your current pregnancy

Please answer all of the following questions by ticking most appropriate box or filling the appropriate information

11. How far along are you in this current pregnancy?

Please answer in weeks and days (eg 12 weeks and 5 days)

12. Was this pregnancy planned?

No

Yes

13. When did you first see a doctor for this pregnancy?

Please provide your best estimate in weeks (eg 6 weeks)

Knowledge, Attitudes and Practices of antepartum and intrapartum ca...

Quiz on Antepartum Care

Please select the most appropriate answer based on your current understanding of pregnancy, without consulting any external sources

21. What is the crown-rump length primarily used for?

☐ Ensure good growth of the baby

☐ Date the pregnancy

☐ Screen for down syndrome

☐ Check the mother's womb

☐ Ensure sufficient amniotic fluid surrounding the baby

22. Please pick the most appropriate match regarding Down Syndrome Screening tests

☐ First Trimester screen; from 10 weeks; Scan and Blood Test

☐ NIPT; from 10 weeks; Scan only

FormSG interface that participants experience and view

Recruitment poster, placed in outpatient clinics

References

1. Hinkle SN, Schisterman EF, Liu D, Pollack AZ, Yeung EH, Mumford SL, Grantz KL, Qiao Y, Perkins NJ, Mills JL, Mendola P, Zhang C. Pregnancy Complications and Long-Term Mortality in a Diverse Cohort. Circulation. 2023 Mar 28;147(13):1014-1025. doi: 10.1161/CIRCULATIONAHA.122.062177. Epub 2023 Mar 8. PMID: 36883452; PMCID: PMC10576862.
2. Athinaidou AM, Vounatsou E, Pappa I, Harizopoulou VC, Sarantaki A. Influence of Antenatal Education on Birth Outcomes: A Systematic Review Focusing on Primiparous Women. Cureus. 2024 Jul 14;16(7):e64508. doi: 10.7759/cureus.64508. PMID: 39139345; PMCID: PMC11320171.
3. El-Shrqawy EH, Elnemer A, Mohamed Elsayed H. Effect of antenatal education on pregnant women’s knowledge, attitude and preferences of delivery mode. BMC Pregnancy Childbirth. 2024 Nov 12;24(1):740. doi: 10.1186/s12884-024-06922-0. PMID: 39533248; PMCID: PMC11555940.
4. Hooper E, Mechkaroff O, Upitis A, Schofield E, Carland JE, Henry A. The effectiveness of antenatal education on improving labour and birth outcomes - A systematic review and meta-analysis. Women Birth. 2025 Jan;38(1):101843. doi: 10.1016/j.wombi.2024.101843. Epub 2025 Jan 2. PMID: 39752771.
5. Bashir S, Ansari AH, Sultana A. Knowledge, Attitude, and Practice on Antenatal Care Among Pregnant Women and its Association With Sociodemographic Factors: A Hospital-Based Study. J Patient Exp. 2023 Jun 22;10:23743735231183578. doi: 10.1177/23743735231183578. PMID: 37377764; PMCID: PMC10291858.
6. Tan TC, Tan SQ, Wei X. Cross-sectional pregnancy survey on fertility trends and pregnancy knowledge in Singapore. J Obstet Gynaecol Res. 2011 Aug;37(8):992-6. doi: 10.1111/j.1447-0756.2010.01471.x. Epub 2011 Apr 4. PMID: 21463429.
7. Shum KW, Ang MQ, Shorey S. Perceptions of physical activity during pregnancy among women: A descriptive qualitative study. Midwifery. 2022 Apr;107:103264. doi: 10.1016/j.midw.2022.103264. Epub 2022 Jan 29. PMID: 35124350.
8. Lim CCW, Goh MSSM, Chua KH, Seet MJ, Tay SG, Mathur M, Kong JY, Yeo KT. Knowledge and Expectations of Perinatal Care Among Pregnant Women During the COVID-19 Pandemic. Front Glob Womens Health. 2022 Jul 14;3:813731. doi: 10.3389/fgwh.2022.813731. PMID: 35910001; PMCID: PMC9329695.
9. Zarei F, Dehghani A, Ratansiri A, Ghaffari M, Raina SK, Halimi A, Rakhshanderou S, Isamel SA, Amiri P, Aminafshar A, Mosavi Jarrahi A. CheckKAP: A Checklist for Reporting a Knowledge, Attitude, and Practice (KAP) Study. Asian Pac J Cancer Prev. 2024 Jul 1;25(7):2573-2577. doi: 10.31557/APJCP.2024.25.7.2573. PMID: 39068593; PMCID: PMC11480624.