# 6 YEARS REVIEW OF TEENAGE PREGNANCY AND IT'S MATERNAL AND FETAL OUTCOME IN HUSM

DR NADHILAH IZNI BINTI MUHAMMAD

Dissertation Submitted in Partial Fulfilment of the Requirement for Degree of Master of Medicine (Obstetrics and Gynaecology)



UNIVERSITI SAINS MALAYSIA 2022

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## 1.0 CONTENTS

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## LIST OF SYMBOLS AND ABBREVIATIONS

| | |
|---|---|
| HUSM | Hospital Universiti Sains Malaysia |
| USM | Universiti Sains Malaysia |
| GDM | Gestational Diabetis Mellitus |
| PE | Pre-Eclampsia |
| Hb | Haemoglobin |
| MSL | Meconium stained liquor |
| PPH | Post-partum haemorrhage |
| SGA | Smaller gestational age |
| OASIS | Obstetric anal sphincter injury |
| PROM | Prelabour rupture of membrane |
| % | Proportion |
| SPSS | Social Package for the Social Sciences |
| M | Mean score |
| SD | Standard deviation |
| >= | Equal or more than |
| < | Less than |
| =< | Equal or less than |
| P | *P*-value |

APPENDICES:

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1.3 ABSTRAK

**OBJEKTIF:** Untuk mengetahui jumlah kejadian remaja yang mengandung, masaalah sosiodemografi, dan untuk mengetahui risiko obstetrik dan komplikasi kandungan di Hospital Universiti Sains Malaysia dari tahun 2015 sehingga 2020.

KAEDAH KAJIAN: Kajian kohort retrospektif ini melibatkan semua pesakit remaja yang mengandung dan melahirkan anak di Hospital Universiti Sains Malaysia. Data sosiodemografik, risiko obstetrik dan komplikasi diambil dari fail catatan kes pesakit. Data dianalisis mengunakan analisis univariat dan ujian CHI square atau Fisher tepat ujian akan digunakan untuk pemboleh ubah bebas kategori dan ujian bebas atau ujian Mann Whitney U akan digunakan untuk pemboleh ubah bebas berangka bergantung pada normalitas data untuk mencari hubungan antara faktor hasil obstetrik dan neonatal dan sosiodemografik.

**KEPUTUSAN:** Sejumlah 405 ibu bawah umur menyertai kajian ini. Mereka dibahagikan kepada 2 kumpulan iaitu kumpulan ibu bawah umur muda (n=71) dan kumpulan ibu bawah umur tua (n=334). Kumpulan bawah umur muda adalah kumpulan umur sama atau dibawah umur 16 tahun dan kumpulan ibu bawah umur tua adalah kumpulan umur diatas 16 tahun sampai dibawah 20 tahun.Kelaziman kelahiran ibu bawah di HUSM adalah 1.01% dan kejadian kelahiran adalah 10 kelahiran dalam 1000 wanita.Kebanyakan ibu dibawah umur mempunyai pendidikan yang rendah iaitu 88.9% hanya mempunyai pendidikan sekolah menengah dan

8.9% tidak mempunyai apa-apa pendidikan berbanding dengan hanya 1.2% yang mempunyai pendidikan tinggi.

Kejadian eklampsia dikalangan kumpulan ibu bawah umur muda adalah tinggi (4.1%) berbanding dengan kumpulan ibu bawah umur tua (0.3%).

Kumpulan ibu bawah umur muda mengalami insiden pendarahan selepas bersalin yang lebih tinggi(5.6%) berbanding kumpulan ibu bawah umur tua (2.7%). Kejadian tiada komplikasi ketika kelahiran adalah tinggi di dalam kumpulan ibu bawah umur tua(93.7%) berbanding ibu bawah umur muda(91.5%). Kejadian komplikasi ketika kelahiran adalah seperti uri melekat, air ketuban mempunyai mekonium, sangkut bahu dan kejadian kecederaan otot dubur adalah rendah di dalam kedua-dua kumpulan.

Di sini, didapati, tiada perbezaan dalam kejadian Pre-eklampsia, PROM, anemia dan hasil kelahiran yang teruk. Sebanyak 89.7% ibu di bawah umur  adalah dari bangsa melayu dan kejadian mengandung sebelum berkahwin(17.8%) dan ibu yang tidak berkahwin(11.9%) adalah tinggi.

**KESIMPULAN:** Kumpulan ibu bawah umur muda mempunyai kejayaan yang lebih tinggi di dalam kelahiran secara normal berbanding kumpulan ibu bawah umur tua. Kedua-dua kumpulan ini mempunyai kejadian tiada komplikasi ketika kelahiran yang sama.

Di sini tiada perbezaan ketara didalam komplikasi sewaktu mengandung, cara bersalin dan hasil kelahiran di dalam kedua-dua kumpulan.

*Kata Kunci: Ibu bawah umur, komplikasi sewaktu mengandung, hasil kelahiran, komplikasi sewaktu bersalin.*

## 1.5 ABSTRAK

**OBJECTIVE:** To determine the incidence of the teenage pregnancy, it sociodemographic issues and to determine the obstetric risks and complications of teenage pregnancy in HUSM from the year 2015 till 2020.

**STUDY METHOD:** This retrospective cohort study involved all the teenage pregnancy patient that delivered in Hospital Universiti Sains Malaysia. The data for sociodemographic, obstetric risks and complications were collected from the patient notes. Data were analyzed using univariate analyses and Chi square test or Fisher exact test will be used for categorical independent variable and independent t-test or Mann Whitney U test will be used for numerical independent variable depending on normality of data to look for the obstetric and neonatal outcome and as well as sociodemographic.

**RESULTS:** A total of 405 teenage pregnancy patient participated in this study. They are divided into 2 groups, young teenage pregnancy (n=71) and older teenage pregnancy (n=334). Young teenage pregnancy group are the group that equal or less than 16 years old, while older teenage group are older than 16 years old lesser than 20 years old. The prevalence of teenage pregnancy in HUSM is 1.01% and the mean incidence are 10 births out of 1000 women. The teenage pregnancy found to have low in education level where 88.9% had only attended secondary school and 8.9% did not have any education level compare to only 1.2% had attending college or university.

The incidence of eclampsia in younger teenage group found to be higher (4.1%) compare to older teenage group (0.3%). However this is not significantly different between this two group.

Post-partum hemorrhage found to be higher in younger teenage group (5.6%) compare to older teenage group(2.7%). Uncomplicated intrapartum outcome are more higher in older teenage pregnancy group(93.7%) compare to young teenage pregnancy group(91.5%). Complicated delivery such as retained placenta, meconium stained liquor, shoulder dystocia and obstetric anal sphincter injuries are found to be low in both teenage group.

There is however no significant different in the incidence of Pre-eclampsia, PROM, anemia and adverse birth outcome. 89.7% of the teenager pregnancy are from Malay ethnicity(87.9%) and incidence of premarital conception(17.8%) and single mother(11.9%) are higher.

CONCLUSION

The younger teenage group have higher rate of successful at spontaneous delivery compare to older teenage group. Both groups have uncomplicated intrapartum outcome.

There are no significant different in antenatal complications, mode of deliveries and birth outcome in both teenage pregnancy groups.

*Keywords: teenage pregnancy, antenatal complications, birth outcome, intrapartum outcome.*

## 2.0 INTRODUCTION

Teenage pregnancy is defined by World Health Organization as pregnancy that occurs among adolescent girls aged between 10-19 years old.[1] Teenage pregnancy is a global social problem related to a wide range of adverse health and social outcomes impacting teenagers, families and society.[2]It not only occurring in the low income country, it also occurring in high and middle income country. Teenage pregnancy is a serious public health and social problem, with 95% occurring in developing countries.[1].

Every year, WHO estimated 21 million girls aged 15–19 years in developing regions become pregnant and approximately 12 million of them give birth. At least 777,000 births occur to adolescent girls younger than 15 years in developing countries.[1]

From the statistics of Malaysia Welfare Department for the year 2010 (from January to April), reported that approximately 111 unmarried young girls were pregnant and the recorded rate was 6 births per 1000 women aged 15-19 years.[4] Ministry of Health recorded 18,847 pregnant girls aged 10-19 at Malaysian public health facilities in 2012, which constituted 3.2% of the estimated 580,536 pregnant mother that year estimated about 32 out of 1,000 pregnancies.[5] Even though the teenage pregnancy rate in Malaysia is fairly low relative to other countries, it not reflect the actual figure, as illegal abortion and infant abandonment are on the rise among teenage mothers.[6] Teenage pregnancy is considered to be high-risk condition that leads to adverse perinatal and obstetric outcomes.

Pregnancy-related complications include anemia (approximately twice as likely) OR 1.82(99% Cl 1.63-2.03), pregnancy induced hypertension (RR1.7, 99% Cl 1.3-2.4), pre-eclampsia OR 1.3(99% Cl 0.94-1.82), gestational diabetes and maternal death. [7]

Delivery complications include emergency caesarean section, preterm birth, protracted labour secondary to underdeveloped pelvis, vacuum assisted extraction/ forceps delivery, breech presentation, asphyxia at birth and nuchal cord entanglement.[8]

Complications from pregnancy and childbirth are the leading cause of death among teenagers in the developing country.[26] However in the more recent studies stated that teenage pregnancy are not per-risky one. In the extremely young teenage mother which is younger than 15 years old, however, is a clear risk group which are confronted with various medical risks such as Pre-eclampsia, preterm labour and small gestation age. This group also marked social advantage such as poverty, unemployment, low education level and single parenting. This study have been done in Austria.[9]

There were a based cohort study assessed in Swedish populations using record linkage of census data with at least 30 years follow-up for health implications for the teenage mother. Compared with mothers aged 20–24 years at first birth, there was a 70% increase in the risk of premature death for mothers aged 17 years or under at first birth, and a 50% increase for those aged 18–19 years.[10] These increased risks are related to health damaging lifestyles, poor psychosocial health or a violent environment, all factors known to be closely associated with poverty and deprivation.[7]

Primary care team and government play an important role on these issues. They can provide the education on reproductive health, the responsible on sexual behaviour, contraception counselling that reinforce appropriate contraceptive practices to prevent unwanted pregnancy.

We can reduce the prevalence of the teenage pregnancy through greater understanding of the antecedents of teenage pregnancy.

# 3.0 LITERATURE REVIEW

## 3.1 SOCIODEMOGRAPHIC OF THE TEENAGE PREGNANCY

Teenage pregnancy are considered to be high risk conditioned. This high risk conditioned can lead to adverse perinatal and obstetric complications and psychological problems.

A retrospective study was conducted in the in Hospital Tunku Ja'afar, Seremban regarding Prevalence of teenage pregnancy in 2015-2016 and its obstetric outcome compared to non-teenage pregnancy. The result of this study show that the prevalence of teenage pregnancy was 2.8%. The mean age of the teenage pregnancy group was 17.9.[6]

There is another study that been done in Indonesia (in 2020). The prevalence of teenage pregnancy between the age of 12 and 19 years old was 11.4%.[11]

Satin at al. in their research on Maternal youth and pregnancy outcomes on the Middle school versus high school age groups in US compared with women beyond the teen years in the year of 1994. Middle school-aged mothers were disproportionately black , and very low birth weight was increased in these youthful mothers. First births to high school-aged mothers were not found to be compromised compared with those of women 20 to 22 years old, and, indeed, cesarean birth was less frequent in these women compared with those ≥ 20 years old.[12]

There are few factors for teenage pregnancy that have been investigated by Heymanot Mezmur at al. in 2021. The factors for teenage pregnancy were not being in school, lack of formal

education, being married, parental divorce, having elder sister who had a history of teenage pregnancy, and not knowing fertile period in menstrual cycle. This study concluded that one in three teenagers had been pregnant. The prevalence of teenage pregnancy in Ethiopia were 30.2%.[13]

3.2 Risks factor for teenage pregnancy

In the Obstetric and Gynecology journal (TOG) regarding management of teenage pregnancy ; stated regarding risk factor for teenage pregnancy. Multiple socioeconomic risk factors have been identified. The factors are socioeconomic group, lower socioeconomic group, low educational achievement, having had teenage pregnancy, being in the care of social services, poor transitional from school to work at 16 years of age, sexual abuse, mental health problems and crime. In the western Europe, the highest rate of teenage pregnancy is in the United Kingdom. In the teenage pregnancy, the 13-16 years old group has the highest adverse outcome particularly the preterm birth.

Nagandla et al(2020) stated that a quarter of teenagers 23.8% were unmarried compared to just 1 of the adults[6]. Ruhaizan et(2013) all reported there is rising of trends of children born out of wedlock where in 2011 noted total delivery of unwed was 2.06% out of all deliveries.[14]

Teenage mother have a lower socio-economic background, live in a lone parent family and parents who show less interest in their educations. The teenager from the vulnerable background have higher risk of becoming a mother before 20 years which is as nearly as one in three teenagers. This study have been done by S Paranjothy et al.(2009)[7]

In the survey by Haymanot et al. on 2020 in Eastern Ethiopia noted that the prevalence of teenage pregnancy is 11% higher among teenagers without formal education compare to

those who had formal education (APR=2.83; 95% CI: 1.93,1.19). The prevalence of teenage pregnancy among teenager from divorced parents was 1.24 times higher than married parents (APR=1.24; 95% CI: 1.08,1.42).[13]

3.3 Obstetric Outcome on teenage pregnancy.

Teenage pregnancy occupied around 11.6% of global birth (21 millions) in each. Their ages are between 15 to 19 years old.[3] Teenage pregnancy have major health consequences for adolescent mothers and their babies. Pregnancy and childbirth complications are the leading cause of death among girls aged 15–19 years globally, with low- and middle-income countries accounting for 99% of global maternal deaths of women aged 15–49 years.[1]

Obstretric outcome in teenage pregnancy including anemia, pre-eclampsia, bleeding during pregnancy, eclampsia, intrauterine growth restriction and gestational diabetes mellitus.

3.3.1 Anaemia

Anaemia is defined as haemoglobin concentration less than 11g/dL. Anemia increases perinatal risks for mothers and neonates; and increases overall infant mortality. A number of studies showed teenage pregnancy are associated with anemia.[10,15,16] It is because higher iron intake is necessary to satisfy the state of rapid growth, which involve intense biological modifications. This situation can lead to iron deficiency which can result in physical and cognitive damage to both teenager and also fetus.[15] The odds for fetal growth restriction and low birth weight are tripled. The odds for preterm delivery are more than doubled. Even a moderate hemorrhage in an anemic pregnant woman can be fatal.

Konje et al(1992) stated that anaemia was 2.53 times more common in teenage pregnancy in age of 10-16 years compare to adults.[17] Berenson et al(1997) found that there is more frequency in 12-15 years to have haematocrit less than 30g/dl compared to 20-22 years old. Study in Indonesia by Junita et al. (2019) found that teenage pregnancy mother had higher experiencing anemia at labour (OR: 4.84;95% CI 1.22-19.2).[11]

Ehrenthal et al. in 2012 also found that women below 20 years old had 1.3 times higher risk for peripartum transfusion compared to women aged 20-34 years old.[18] This study had been done in the US.

### 3.3.2 Gestational Hypertension

Gestational Hypertension is defined as hypertension that occurred during pregnancy after 20 weeks of gestation with Systolic more than 140mmhg or Diastolic more than 90mmHg. This complication of pregnancy is a predictor of developing pre-eclampsia in adults.

Risk of gestational Hypertension was 1.7 times higher in nulliparous 10-16years compared with socio-economic class matched nulliparous controls in UK, a study done by Konje et al.(1992)[17] However there is no increased in the frequency of preeclampsia. Kayastha s. et al. (2012) stated that hypertension was 6.4% and 5.5% in teenage and control group respectively (p=0.66) in Nepal.[19]

### 3.3.3 Pre-eclampsia and eclampsia

Pre-eclampsia is a development of hypertension and significant proteinuria after 20 weeks of gestation. Eclampsia is defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or in postpartum period in women with sign and symptoms of pre-eclampsia. Ashok Kumar et al.(2007) stated that pre-eclamptic toxemia (PET) is 4.3 % in

teenage pregnancy compared to 0.6% in control group and the risk of eclampsia 4.9% in teenage pregnancy compared to 0.6% in control group.[20] This study have been done in India.

### 3.4 Delivery complications

Teenage pregnancy can lead to delivery complications. Delivery complications include emergency caesarean section, preterm birth, vacuum or forcep delivery, protracted labour due to underdeveloped pelvis, postpartum haemorrhage or meconium stained liquor.

#### 3.4.1 Preterm birth

Preterm birth is a baby that delivered less than 37 weeks of gestational. It usually associated with respiratory distress syndrome, retinopathy, chronic lung disease and increased in neonatal mortality rate. There were few study that found premature birth was more common in teenage pregnancy compared to adult controls. Examples in Nagandla et al. (2020) study which have been done in Malaysia noted that incidence of preterm birth is higher in the teenage group (26; 15.9%) compare to non-teenage group (9;5.4%).[6]

#### 3.4.2 Instrumental delivery

The use of instrumental delivery is to achieve a safe vaginal birth. Examples of instrumental deliveries are vacuum cup (ventose) or forceps. It is recommended when the conditions of either baby or the mother makes it less safe to allow for normal birth to occur.

The incidence of instrumental delivery was more in control group although it was not statistically significant(Kayastha et al.)[19].

#### 3.4.3. Neonatal Mortality

The risks of neonatal mortality was increased among mother aged 13-15 year, while the mother aged 18-19 years had a significant increased risk of post neonatal mortality only.[18] Post neonatal mortality is associated with premature deliver. The younger the age of the teenage pregnancy, the higher the risk of neonatal mortality. The study by Petra Otterblad et al, conclude that the increased of neonatal and post neonatal mortality among teenagers may be related to biological immaturity.[21] There are also some study that stated that lack of prenatal care in teenage pregnancy predispose this patient to preterm deliveries.[22]

## 4.0 JUSTIFICATION OF STUDY

There is no latest study of the teenage pregnancy have been carried out in HUSM. This study will help to determine and to provide data on the outcome of the teenage pregnancy. It also can provide data that can improve our management toward teenage pregnancy. This study also will help us to create and provide awareness among teenager regarding the risks and severity of teenage pregnancy and the important of proper antenatal follow up.

## 5.0 OBJECTIVES

### 5.1 GENERAL OBJECTIVE

To study the 6 years obstetric outcomes of teenage pregnancy in HUSM from January 2015-December 2020.

### 5.2 SPECIFIC OBJECTIVE

1.To determine the incidence of teenage pregnancy in HUSM.

2.To evaluate the sociodemographic of the teenage pregnancy in HUSM.

3.To determine the obstetric risks and complications occurred in teenage pregnancy.

## 6.0 METHODOLOGY

### 6.1 STUDY DESIGN, SETTING AND DURATION

This is a retrospective cohort study that was conducted in Hospital Universiti Sains Malaysia, Kubang Keraian, Kota Bharu, Kelantan. It is a tertiary hospital and the referral center of other hospitals in the district of Kelantan . This study was carried out from January 2015 until December 2020.

### 6.2 REFERENCE POPULATION

All teenage pregnancy woman who is less than 20 years old and delivered in Hospital Universiti Sains Malaysia.

Study participant

All patients who fulfilled the selection criteria and delivered in Hospital Universiti Sains Malaysia, Kubang Kerian from January 2015 till December 2020.

### 6.3 SOURCE POPULATION

All teenage pregnancy patients who fulfilled the selection criteria and delivered in Hospital Universiti Sains Malaysia, Kubang Kerian.

6.4 SAMPLE SIZE CALCULATION

Sample size is calculated for all the factors to be studied. Using Power and Sample size (PS) Software.

Table 1: sample size calculation.

$$n_{sensitivity} = \frac{Z_{(1-\alpha/2)}^{2}}{\Delta^2 P} * S_N(1 - S_N)$$

where;
$\alpha$ = Type I error
$\Delta$ = precision of estimation
$P$ = Prevalence
$S_N$ = Sensitivity

$$n_{specificity} = \frac{Z_{(1-\alpha/2)}^{2}}{\Delta^2 (1 - P)} * S_P(1 - S_P)$$

where;
$\alpha$ = Type I error
$\Delta$ = precision of estimation
$P$ = Prevalence
$S_p$ = Specificity

| | Prevalence | Sample size calculated | Total number sample (include 10% drop out) | Total number sample (include 20% drop out) |
|---|---|---|---|---|
| 1.antenatal care | 0.27 | 303 | 337 | 397 |

| | | | | |
|---|---|---|---|---|
| 2. Pre-eclampsia | 0.237 | 278 | 309 | 333 |
| 3. Apgar score | 0.32 | 335 | 373 | 402 |

Reference : Nagandla K, Kumar K (2020) Table 3

The biggest sample size for objective 2 will be 402

Therefore, the final sample size for this study is 402.

## 6.5 ETHICS AND CONSENT

The conduct of this study was approved by the Human Medical Research and Ethics Committee of USM dated 5$^{TH}$ December 2021. (Appendix 1)

## 6.6 INCLUSION AND EXCLUSION CRITERIA

### 6.6.1 INCLUSION CRITERIA

All pregnant woman who is less than 20 years old and delivered livebirth or stillbirth in Hospital Universiti Sains Malaysia, Kubang Kerian, Kota Bharu.

### 6.6.2 EXCLUSION CRITERIA

1. Unviable pregnancy which is the pregnancy is less than 24 weeks or foetus is less than 500gm.