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Obstetric and Perinatal Outcomes in a Sample of Teenagers and Older Pregnant Women, Baghdad 2016

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Summary

A teenage mother is more likely to drop out of high school, affect employment and social class, increased risk for preterm delivery and low birth weight, less likely to receive prenatal care. Advanced maternal age associated with increased risks of birth defects, low birth weight, increase rate of caesarean section, gestational diabetes, preeclampsia.

The objective of the study is to identify obstetric and perinatal outcomes among teeagers and old pregnant women (older than 35 years) in a sample of maternity hospitals in Baghdad, 2016.

A comparative cross-sectional study, carried out in three hospitals during the period of 15th of March 2016-15th of June 2016.

A convenient sample of pregnant women admitted for delivery were included. The pregnant women were divided into three groups: group A represents 120 pregnant women aged below 20 years(teenage pregnant), group B represents 120 pregnant women aged 20-34 years (low risk pregnancy) and group C represents 92 pregnant women aged 35+ years (advanced age pregnant).In a comparison between group A and B; group A had higher proportion of participants that visited clinics for 1st time in the 1st trimester (62.5%) emergency type of Cesarean section (62.9%), fetal distress, contracted pelvis and obstructed labor than group B. In a comparison between group C and B; group C had higher proportion of participants who had one or two visits, Hypertensive disorders of pregnancy, medical disorders fetal distress than group B. No association found between antepartum hemorrhage, postpartum hemorrhage, premature delivery, still birth and neonatal care admission anemia, and maternal age.

In conclusion adolescent mothers tend to visit antenatal care (both public and private) more than and at early stage of pregnancy. Women aged 35 year or more had delayed antenatal care and less numbers of visits and a higher proportion of complications during pregnancy like hypertension disorder of pregnancy, medical disorders and caesarean section.

Introduction

Teenage pregnancy

Definition

Teenage pregnancy is defined as a teenage girl, usually within the age of 13-19, becoming pregnant. The term in every day speech usually refers to girls who have not reached legal adulthood (which varies across the world) who become pregnant. [1, 2].

Causes of Teen Pregnancy:

I. Culture: Rates of teenage pregnancies are higher in societies where it is traditional for girls to marry at young age and where they are encouraged to bear children so soon as they are able like in some sub-Saharan African countries. [3] Early marriage and pregnancy is more common in traditional rural communities than in cities [4]. Economic incentives also influence the decision to have children, in societies where children are sent to work at an early age, it is economically attractive to have many children [5]. In societies where adolescent marriage is less common, such as many developed countries, sex at young age and lack of use of contraceptive method may be factors in teen pregnancy, although these countries provide comprehensive and balanced information about sexuality [6-8].

II. Socioeconomic factors: Child bearing during the teen years is both a result and a cause of poverty. The socioeconomic factors that put teenagers at risk of childbearing will make teen parents continue to live in poverty. Those are teens with less education, members of racial and ethnic minority groups and those who live in communities with high rates of both poverty and non-marital births [9].

III. Other family member: Teen pregnancy and motherhood can influence younger siblings. The younger sisters and brothers of teen mother are less likely to emphasize the importance of education and employment and more likely to accept parenting and marriage at younger ages. [10]

IV. Early puberty: Historical data from USA and several European countries show a clear secular trend, with age at menarche declining at a rate of 2-3 months per decade since the 19th century, resulting in overall declines of about 3 years [11]. The decline in the age of menarche is attributed mostly to improved health and nutrition [12].

V. Sexuality: In most countries, most men experience sexual intercourse for the first time before the 20th birthday [13]. Men in western developed countries have first time sex sooner than in undeveloped and culturally conservative countries such as Sub-Saharan Africa and much of Asia [14]. The Youth Risk Behavior Study (YRBS) suggested that almost one half of the US high school students have had sexual intercourse before the age of 13 years [15].

VI Role of drug and alcohol use: The drugs with the strongest evidence linking them to teenage pregnancy are alcohol, cannabis and other substituted amphetamines. The drugs with least evidence to support a link to pregnancy is opioids, such as heroin, morphine, and oxycodone, that significantly reduced libido. [6, 15-17]

VII Lack of contraception: Although knowledge and use of contraception has been increasing globally, many teenagers have inadequate protection against pregnancy and contraception use among teenagers is still very low. For example, in 2005, only 51.8% teenagers consistently

use contraception in Italy [18]. This may be related to lack of knowledge of, or access to, conventional methods of preventing pregnancy [19,20]. More than 80% of teen pregnancies are unintended [21]. Over half of unintended pregnancies were to women not using contraceptives [22] most of the rest are due to inconsistent or incorrect use [21].

VIII Age gap in relationship: Teenage girls in relationships with older males, are more likely to become pregnant than those in relationship with boys of their own age [24]. They are also more likely to carry their baby to term rather than have abortions [25].

IX Sexual abuse: Multiple studies have indicated a strong link between early childhood sexual abuse and subsequent teenage pregnancy in industrialized countries. Up to 70% of women who gave birth in their teens were molested as young girls or coerced by older males, [26-29].

X Personal characteristics: Associated personal characteristics include behavioral problems, depression, low self–esteem, and poor self-control. Intimate partner violence (IPV) and past episodes of sexual abuse are also determinants [30,31].

XI Childhood environment: Women exposed to abuse, domestic violence, family strife in childhood, and family dysfunction are more likely to become pregnant as teenagers, and the risk of becoming pregnant as a teenager increase with the number of adverse childhood experiences [32-37].

XII Media influence: Adolescents who were more exposed to sexuality in the media were also more likely to engage in sexual activity themselves .

Prevalence:

Worldwide, about 16 million adolescent girls aged 15-19 give birth each year, roughly 11% of all births worldwide. Almost 95% of these births occur in developing countries [38]. They range from about 2% in china to 18% in Latin America and the Caribbean . Half of all adolescent births occur in just seven countries: Bangladesh, Brazil, the Democratic Republic of Congo, Ethiopia, Nigeria, India and the United States. [39] Among developed countries, the United States, United Kingdom and New Zealand have the highest level of teenage pregnancy, while Japan and South Korea have the lowest in 2001[40].

Approximately 15 million girls under the age of 20 in the world have a child each year. Estimates revealed that 20-60% of these pregnancies in developing countries are mistimed and un-wanted [23].

Around 13 million children are born to women aged under 20 worldwide; more than 90% in the developing countries. Complications of pregnancy and child birth are the leading cause of mortality among women aged 15-19 in such area [41].

Sub – Saharan Africa: The highest rate of teenage pregnancy in the world is in Sub-Saharan Africa, where women tend to marry at an early age [42]. In Niger, for example, 87% of women surveyed were married and 53% had given birth to a child before the age of 18 [3].

India: In the Indian subcontinent, early marriages sometimes result in adolescent pregnancy, particularly in rural regions where the rate is much higher than in urbanized area. Latest data suggests that teen pregnancy in India is high with 62 pregnant teens out of every 1,000 women [43].

Asia: The rates of early marriage and pregnancy in some Asian countries are high [4]. The rates have decreased sharply in Indonesia and Malaysia. However, in industrialized Asian

nations such as South Korea and Singapore, teenage birth rates remain among the lowest in the world [4].

United Kingdom: The teen pregnancy rate in England and Wales was 23.3 per 1,000 women aged 15 to 17. There were 5,740 pregnancies in girls aged under 18 in April to June 2014. Historically, the UK has had one of the highest teenage pregnancy and abortion rates in Western Europe.

Over the last decade, there is a huge decline in the number of babies born to teenage mothers, in part due to the improvements in contraception advice and services for younger women, with a straightforward access to abortion services when their chosen method lets them down [44].

United State: The teenage birth rate in United States is the highest in developed world, and the teenage abortion rate is also high [5]. In 2005, the majority (57%) of teen pregnancies in the US resulted in a live birth, 27% ended in an induced abortion, and 16% in a fetal loss [45]. The teenage pregnancy rate decreased significantly in 1990; this decline manifested across all racial groups, although teenagers of African – American and Hispanic descent retain a higher rate, in comparison to that of European – Americans. About 25% of the decline was attributed to abstinence and 75% to the effective use of contraceptives [46].

Australia: In 2013, the birth rate among teenage women in Australia was 14.6 births per 1,000 women; the rate has fallen from 55.5 birth per 1,000 women in 1971 probably due to ease of access to effective contraception, rather than any decrease in sexual activity [47].

Canada: The Canadian teenage birth has also trended to bards steady decline for both 15-17 and older 18-19 teens in the period between 1992 and 2002 [48]. However, teen pregnancy has been on the rise since 2013 [49].

Arab area: The reproductive pattern in the kingdom of Saudi Arabia is characterized by pregnancy starting at an early age, high fertility throughout the reproductive span, low educational attainment of the mother and poor coverage antenatal services. [50] The kingdom of Saudi Arabia is one the countries where family planning is not usually practiced, resulting in high birth rate. The total teenaged deliveries at the Riyadh Armed Forces Hospital (RAFH), Riyadh- kingdom of Saudi Arabia have increased steadily from 1377 deliveries in 1977 compared to 7860 deliveries in 1999. [51] In Kuwait 8.4% of all women giving birth in hospitals were teenager. [52]

Teenage pregnancy in Iraq was increasing from 38 per 1,000 women ages 15-19 years in 2011 to 80 per 1,000 women aged 15 -19 years in 2014. [53]one in seven girls in the Arab region marry before her 18th birthday, the highest rate of child marriage is found in the poorest countries such as Yemen, Sudan and Somalia. [54]

Effects:

Pregnancies among girls less than 18 years of age have irreparable consequences, it violates the rights of girls, with life–threatening consequences in term of sexual and reproductive health, and poses high development costs for communities, particularly in perpetuating the cycle of poverty [55].

I. Mother:

1. A teen mother is more likely to drop out of high school [56], however studies have found that many of these mothers had already dropped out of school before becoming pregnant but

those in school at the time of their pregnancy were as likely to graduate as their peers [57]. Women who gave birth teens completed secondary – level schooling 10-12% as often and pursued post – secondary education, 14-29% as often as women who waited until age 30[58].

2. Young motherhood in an industrialized country can affect employment and social class. Less than one third of teenage mothers receive any form of child support, vastly increase the likelihood of turning to the government for assistance [59]. A study of 100 teenage mothers in the UK found that only 11% were unemployed [60].

3. Adolescent motherhood can have an increase in the risk of mental health problems, including depression that reduces the ability to form attachments, interferes with attentiveness and nurturing, and results in disengagement from the child [61]. Stress can also take a roll on a teen mother and her children – physically, mentally and emotionally. For example, one study found that high levels of hormones produced when under stress were associated with lower fetal weight [63]. Teenage women who are pregnant are seven times more likely to commit suicide than other teenagers [63].

4. Nearly 1 in 4 teen mothers will experience another pregnancy within two years of having first [64]. Many teen parents do not have the intellectual or emotional maturity that is needed to provide for another life. Often, these pregnancies are hidden for mothers resulting in a lack of adequate prenatal care and dangerous outcomes for babies [65].

5. About 5% of all teen mothers reported that they were homeless at the time they gave birth [66]. In New York, over 1,252 teens with 694 children sought shelter in a facility for runaway and homeless youth in 2005 [67].

II. Child:

1- The children of teen mothers are more likely to be born prematurely with a low birth weight, predisposing them to many other lifelong conditions [68].

2- Children of teen mother are at higher risk of intellectual, language, and socio-emotional delays [65].

3- Developmental disabilities and behavioral issues are increased in children born to teen mother [69, 70]. One study suggested that adolescent mothers are less likely to stimulate their infant through affectionate behaviors such as touch, smiling and verbal communication, or to be sensitive and accepting toward his or her needs [69].

4- in the children of teenage mothers has also been noted, with many of the children being held back a grade level, scoring lower in standardized tests, and or failing to graduate from Poor academic performance secondary school [56].

5- Daughter born to adolescent parents are more likely to become teen mothers themselves [39, 54]. Sons born to teenage mothers are three times more likely to serve time in prison [71].

III. Medical:

1. Most studies from developed and developing countries have consistently reported that teenage pregnancies were at increased risk for preterm delivery [72, 73] and low birth weight [72, 74-77]. Although some studies failed to find such an association [78, 79].

2. The relation between teenage pregnancy and small for gestational age (SGA) births in teenage mothers has been reported by some studies [74, 80-82].

3. Increase risk of neonatal mortality among infant born to teenage mothers [72, 83, 84].

4. Pregnant teens are less likely to receive prenatal care, often seeking it in the third trimester, if at all [85]. One third of pregnant teens receives insufficient prenatal care and that their children are more likely to have health issues in childhood or be hospitalized than those born to older women [86].

5. Pregnant teens are at risk of nutritional deficiencies from poor eating habits common in adolescence, including attempts to lose weight through dieting, skipping meals, food faddism, snacking, and consumption [87]. Inadequate nutrition during pregnancy is an even more marked problem among teenagers in developing countries [88, 89].

6. Young mothers and their babies are at greater risk of contracting HIV [41].

7. Risk of death following pregnancy is twice as high for women aged 15-19 than for those aged 20-24[3].

8. Illegal abortion also holds many risks for teenage girls in areas such as sub-Saharan Africa [3].

9. Risk for medical complications are greater for girls age under 15, as an underdeveloped pelvis can lead to difficulties in childbirth. Obstructed labor is normally dealt with by caesarean section in industrialized nations; however, in developing regions where medical services might be unavailable, it can lead to eclampsia obstetric fistula, infant mortality, or maternal death [41, 90].

10. For mothers who are older than fifteen, age in itself is not a risk factor, and poor outcomes are associated more with socioeconomic factors rather than with biology [85].

Prevention :

Comprehensive sex education and access to birth control appear to reduce unplanned teenage pregnancy.

1. One significant service proven to reduce teen pregnancy is availability and use of contraceptives. About 86% of the decline in the US teen pregnancy rate between 1998 and 2002 is due to improved contraceptive use [91].

2. Education: The Dutch approach to prevent teenage pregnancy has often been seen as a model by other countries. The curriculum focuses on values, attitudes, communication and negotiation skills, as well as biological aspects of reproduction [92].

3. Abstinence- only sex education: is a form of sex education that teaches not having sex outside of marriage, it often excludes other types of sexual and reproductive health education such as birth control and save sex Evidence does not support the effectiveness of abstinence sex education [93]. It has been found to be ineffective in decreasing HIV risk in the developed world [94]. It does not decrease rates of unplanned pregnancy when compared to comprehensive sex education.

Advanced maternal age

It is the instance of woman being at an older age at a stage of reproduction, although there are various definitions of specific age and stage of reproduction [95]. Advanced maternal age usually defined as age 35 years or more for the mother at time of delivery of her baby [96].

Why is parenthood being delayed?

- Women are reaching higher educational level.

- More women in male–dominated fields that are not as understanding or supporting of motherhood.
- Cultural and values shifts have led towards more women not feeling ready to have a child yet.
- Lack of child care, low benefit levels, and work place polices that signal to women that they cannot be both a wage earner and a mother.
- Divorce, going through multiple partners before down, and living together before marriage leads some people to delay parenthood [97].
- Economic or housing uncertainty, unemployment, temporary work, or unstable labor markets [98].
- Technology of development of cases post – menopausal pregnancies have occurred, and there are several cases of older women carrying a pregnancy to term, usually with in vitro fertilization of a donor egg [99].
- The availability of birth control is partly responsible for women postponing parenthood. [97]

Prevalence:

In the past three decades have seen significant increase in maternal age at childbirth in many high income countries [100]. The proportion of first births to women aged 35 years and over in the United states nearly eight times from 1970 to 2006. In 2006, about 1 out of 12 first births were in women and 35 years and over compared with 1 out of 100 in 1970 [101,103]. In 2009, the birth rate in the US declined in all age groups below 40 years but continued to rise in women aged 40-44 and remained unchanged in women aged 45 and over [100].

Similar trends have been observed in Europe; the percentage of live births to mothers aged 35 and over in UK rose from 8.7 in 1990 to 19.3 in 2004 and in EU-27 the mean age of women of childbirth increased from 29.3 in 2003 to 29.8 in 2009 [104].

This process in not restricted to Europe, Asia and Japan are also seeing average age at first birth on the rise, and increasingly the process is spreading to countries in the developing world like China, Turkey and Iran [96].

Effects:

1. Decreased fertility rate:

A woman's fertility peaks in the early and mid-twenties, after which it starts to decline, with advanced maternal age causing an increased risk of female infertility [105].

- At age 30 years
  - 75% will have a conception ending in live birth within one year of marriage.
  - 91% will have a conception ending in live birth within four years of marriage.
- At age 35 years.
  - 66% will have a conception ending in live birth one year of marriage.
  - 84% will have a conception ending in live birth four year of marriage.
- At age 40 years.

- 44% will have a conception ending in live birth one year of marriage.
- 64% will have a conception ending in live birth four year of marriage.

2. Risks of birth defects:

A women's risk of having a baby with chromosomal abnormalities increase with her age. Down syndrome is the most common chromosomal birth defect, and a women's risk of having a baby with Down syndrome [106]:

- At age 20, 1 in 1,441
- At age 25, 1 in 1,383
- At age 30, 1 in 929
- At age 35, 1 in 338
- At age 40, 1 in 84
- At age 45, 1 in 32
- At age 50, 1 in 44

Other effects:

Advanced maternal age is associated with adverse outcomes in the perinatal period, which may be caused by detrimental effects on decidual and placental development [107] including low birth weight.

Preterm birth [108-110], still birth and unexplained fetal death [111-114], and increase rate of caesarean section [115].

Advanced maternal age at birth has been found to be associated with gestational diabetes, preeclampsia, placenta previa , placental abruption preterm delivery, low birth weight and increase prenatal mortality [116-124].

On the other hand, advanced maternal age is associated with more stable family environment, higher socioeconomic position, higher income and better living conditions, as well as better parenting practices [97].

Objectives:

The objective of the study is to identify obstetric and perinatal outcomes among teeagers and old pregnant women (older than 35 years) in a sample of maternity hospitals in Baghdad, 2016.

Methodology

1. Sudy design:

A comparative cross-sectional study.

2. Study setting and data collection time:

The study was carried out in three hospitals:

1. Obestitrical and gynecological department of Baghdad Teaching Hospital, Medical City.
2. Al Elwiya Maternity Teaching Hospital.
3. Fatima Al Zahra Maternity Hospital, Baghdad, Iraq.

The data collection was carried out during the period of 15th of March 2016 - 15th of June 2016.

3. Sudy participants:

A convenient sample of pregnant women admitted for delivery at these hospitals during the data collection periord and who accepted to participate in the study were included.
The data collection process was conducted for 2-3 days per week during the periord of study from 8:00am to 2:00pm with assistance from colleague doctors working at these hospitals.The data collected from the labour room and the inpatient wards of obestetrics departments in the assigned hospitals.
Data collected through direct interview with the patients and from records of patients' files. The time needed to fill the questionnaire was about 15 minutes. The pregnant women were divided into three groups :
1.The first group represent 120 pregnant women aged below 20 years(teenage pregnant).
2.The second group represent 120 pregnant women aged 20-34 years (low risk pregnancy).[125]
3.Third group represent 92 pregnant women aged 35+ years (advanced age pregnant.

4. Inclusion criteria:

1.All pregnant women admitted to the assigned hospitals for delivery.
2.Having the ability to understand and answer the questions.

5. Data collection tools:

Aquestionnair developed after review of relevant literatures[126-128] and reviewed by the supervisor for the purpose of data collection.The questionnair gather information on the following variables:

1.Demographic data:

a. Age
b. Residance(classified by governorate of residence).
c. Level of education (subdivided into: illetrate,primary,secondary and college+).
d. Gravida (the total number of pregnancy including the current one).
e. Parity (the number of times that she had given birth to a fetus with gestational age of 24 weeks or more,regardless of whether the child was born alive or was still born).
f. Abortion(the number of miscarriage or termination of pregnancies before completed 24 weeks of gestation)[129].
g. History of previous neonatal deaths.

2.Obstetrical data:

a. Gestational age at delivery in weeks depending on either last menstrual periord (LMP) or ultrasound or examination of fundal height . This was classified into:
i. Preterm delivery between 24 and 37 weeks,
ii. Term delivery between completed 37 to 42 weeks,
iii. Post term dilevery above 42 weeks[125].
b. Number of antenatal visits during this pregnancy (adequite number of antenale visits at least 4)[130].
c. Source of antenatal care (primary health care,public clinic, private clinic).

d. Time of first antenatal visit (during first trimester,second trimester or third trimester).

e. History of any complication during current pregnancy diagnosed by the treating gynecologist. This is classified into:genitourinary tract infection,hypertensive disorders of pregnancy after 20 week gestation(gestatonal hypertension is a new onset of hypertension after 20 weeks of gestations,preeclampsia is a multi organ disorder process of unknown etiology characterized by the development of hypertension and protien urea after 20 weeks of gestation and eclampsia is development of convulsions in preexisting preeclapsia) , gestational diabetes(any degree of glucose intolerance with onset or first recognition in pregnancy),intrauterine fetal death(IUD),antipartum hemorrhage (bleeding from the genital tract in pregnancy at≥24 weeks gestation before onset of labour)[125], medical disorders (like cardiac diseases,renal disease,diabetic disease, chronic hypertention either precedes pregnancy or diagnosed within first 20 weeks of gestation ,thyroid disease, rubella, hepatitis,drug allergy or blood transfusion)[131],multiple pregnancy,leaking liquor and others.

f. Hemoglobine level at admission (anaemia is diagnosed if Hb<10.5 g/dl in pregnant women).

g. Mode of delivery: classified as normal vaginal delivery or cesarean section.

h. Cesarean section was classified by urgency into: emergency or elective cesarean.

i. Indication for cesarean section: fetal distress, malpresentation (described as any presentation other than vertix lying close to internal os of the cervix[125]), contracted pelvis, previous cesarean section, obstructed labour and others(midwife intervension,placenta previa,placental abruption,precious baby,sever bleeding and medical complications of the mother)

j. Fetal presentation at labour depending on ultrasound or by examination and classified into: vertix,breach and others.

k. Delivery outcomes: which include live birth , stillbirth(baby born with out sign of life at or after 28 weeks of pregnancy) , the birth weight (normal birth weight range from 2.5 kg to 4.5 kg[132]) and any admission to neonatal care unit.

l. Complication after delivery within hospital admission:(Post-Partum Hemorrhage (PPH):blood loss of 500ml or more from genital tract occuring within 24hr of delivary[125],convulsion,shortness of breath).

Pilot Study

A pilot study was carried out on a purposive sample selected from delivered mother attending the delivery room and from maternity ward, but they were not included in the final sample of the study. The purposes of the pilot study were:

To have an idea about the time needed for the interview to collect the required data.

There were no changes in the questionnaire needed.

Statistical analysis:

The analysis of data was carried out using the statistical package for social science(SPSS)-version 22. Z- test for difference between two proportions and Z- test to asess association between categorical data were used. Statistical significance was considered whenever p-value is less than 0.05.

Ethical considerations and official approval:

Prior permission for utilizing hospital data to conduct this study was obtaind from the Ministery of Health and the adminstration of the assigned hospitals. Verbal approval was obtained from the study participants. Personal information were dealt with confidientaility and were secured in password protected computer. Official permission from Iraqi Board for medical specialization to facilitate my mission was done.

Results

The total number of study group was 332; chosen from three hospitals as shown in table (4.1).

Table 4.1: Distribution of study group by hospitals.

Hospital	No. Of Patients (N=332)	Percentage (%)
Fatima Al-Zahraa	**150**	**45.2**
Al-Elwya Teaching Hospital	**115**	**34.6**
Baghdad Teaching Hospital	**67**	**20.2**

4.1. Obstetrical data

The distribution of study group according to obstetrical data is shown in table (4.2).

- Group A (age < 20years): In this age group, the highest proportion of study patients was prim gravida (59.2%) and about two third of them were nulliparous (65%). The majority of this group had no previous abortion (92.5%) and most of them had no history of previous neonatal death (97.5%).Regarding gestational age, the highest proportion of this study group had delivered a full term baby (85%).
- Group B (age 20 – 34 years):In this group, the highest proportion was multigravida (2-4) (62.5%) and 69.2%of them were multiparous (1-4). About 74% had no previous abortion and most of them had no history of previous neonatal death (94.2%).Regarding gestational age, the highest proportion of them had delivered a full term baby (90%).
- Group C (age ≥ 35 years): In this group, 54.3% were multigravida (≥ 5) and 58.7% was multiparous (1-4). The majority had no previous abortion (81.5%) and most of them had no history of previous neonatal death (95.7%).Concerning gestational age, 85.9% was delivered a full term baby.

Table(4.2): Distribution of study groups according to obstetrical data.

Obstetrical Data	Group: A (Age< 20) N=120		Group: B (Age 20 – 34) N=120		Group: C (Age≥ 35) N=92	
	No.	**(%)**	**No.**	**(%)**	**No.**	**(%)**
Gravida						
Prim Gravida	**71**	**59.2**	**20**	**16.7**	**8**	**8.7**
Gravida (2-4)	**49**	**40.8**	**75**	**62.5**	**34**	**37.0**
Gravida ≥ 5	**0**	**0**	**25**	**20.8**	**50**	**54.3**
Parity						
Nulliparous	**78**	**65.0**	**26**	**21.7**	**10**	**10.9**
Multiparous (1-4)	**42**	**35.0**	**83**	**69.2**	**54**	**58.7**
Grandparous ≥ 5	**0**	**0**	**11**	**9.1**	**28**	**30.4**
Previous Abortions						
No	**111**	**92.5**	**89**	**74.2**	**75**	**81.5**
One Abortion	**9**	**7.5**	**24**	**20.0**	**7**	**7.6**
Two Abortions	**0**	**0**	**4**	**3.3**	**7**	**7.6**
More Than Two Abortions	**0**	**0**	**3**	**2.5**	**3**	**3.3**
History Of Previous Neonatal Deaths						
No	**117**	**97.5**	**113**	**94.2**	**88**	**95.7**
Yes	**3**	**2.5**	**7**	**5.8**	**4**	**4.3**
Gestational Age						
Preterm	**17**	**14.2**	**12**	**10.0**	**10**	**10.9**
Full Term	**102**	**85.0**	**108**	**90.0**	**79**	**85.9**
Post Term	**1**	**0.8**	**0**	**0**	**3**	**3.3**

4.2. Antenatal care data

The distribution of study groups by antenatal care data is shown in table (4.3).

- Group: A (age <20): In this age group, the highest proportion of study patients was visited the antenatal care clinics five visits and more (57.5%) and more than half of them were visited mixed clinics (55%). Concerning the time of 1st antenatal care visit, 62.5%of them visited antenatal care clinics in the 1st trimester for the 1st time.
- Group: B (age 20 - 34):In this age group, 54.1% had visited the antenatal care clinics for five times and more, and 53.3% visited private clinics.Regarding the time of 1st antenatal care visit, 40%visited antenatal care clinics for 1st time in the 2ndtrimester.
- Group: C (age ≥ 35): In this age group, 39.1% visited the antenatal care clinics for three to four times during pregnancy and 35.9% visited private clinics.Concerning the time of 1st antenatal care visit, 47.8%were visited antenatal care clinic for 1st time in the 1st trimester.

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Table (4.3): Distribution of study groups according to antenatal care data.

Antenatal Care Data	Group: A (Age<20) N=120		Group: B (Age 20 – 34) N=120		Group: C (Age≥ 35) N=92	
	No.	(%)	No.	(%)	No.	(%)
No. Of Visit						
(1 – 2)	12	10.0	14	11.7	21	22.8
(3 – 4)	39	32.5	41	34.2	36	39.1
(5 And More)	69	57.5	65	54.1	35	38.1
Place Of Visit						
Public (Public + PHC)	24	20.0	16	13.3	28	30.4
Private Clinic	30	25.0	64	53.3	33	35.9
Mixed	66	55.0	40	33.4	31	33.7
Time Of 1st Visit						
1st Trimester	75	62.5	45	37.5	44	47.8
2nd Trimester	38	31.7	48	40.0	30	32.6
3rd Trimester	7	5.8	27	22.5	18	19.6

4.3. Complication of Pregnancy

The distribution of study groups according to complications during and after pregnancy is shown in table (4.4).

- Group: A (age <20): In this age group, 49.2% developed GUT infection during pregnancy and 98.7% had no complications after delivery.
- Group: B (age 20 – 35): In this age group, 50% GUT infection during pregnancy and 95.8% had no complications after delivery .
- Group: C (age ≥ 35): In this age group, 37%developed GUT infection during pregnancy and 94.6% had no complications after delivery.

Table (4.4): Distribution of groups by complications during and after pregnancy.

Complications	Group: A (Age<20) N=120		Group: B (Age 20 – 34) N=120		Group: C (Age≥ 35) N=92	
	No.	(%)	No.	(%)	No.	(%)
Complication During Pregnancy*						
No Complications	39	32.5	42	35.0	23	25.0
GUT Infection	59	49.2	60	50.0	34	37.0
Leaking Liquor	20	16.7	16	13.3	9	9.8
HTN Disorders Of Pregnancy	4	3.33	5	4.2	11	12.0
Antepartum Hemorrhage	1	0.8	4	3.3	5	5.4
Medical Disorders	2	1.7	1	0.8	9	9.8
Multiple Pregnancy	2	1.7	3	2.5	7	7.6
Gestational DM	0	0	4	3.3	2	2.2
Intrauterine Fetal Death	0	0	1	0.8	1	1.1
Others	3	2.5	4	3.3	8	8.7
Complication After Delivery						
No	118	98.3	115	95.8	87	94.6
Yes	2	1.7	5	4.2	5	5.4

*Patients may have more than one complication, then the percentage is over 100%.

4.4. Complications during delivery

The distribution of study groups according to complications during delivery is shown in table 4.5.

In all age groups, the highest proportion of study group was delivered by vaginal mode of delivery (70.8%, 65.8%, and 60.9% for group A, B, and C, respectively).The highest proportion of those who delivered by emergency CS was in group A (62.9%), and the highest proportion who delivered by elective CS was in group B (73.2%).

The indication for CS was fetal distress in more than one third of group A (37.1%) while the indication was previous CS in the majority of patients in group B & C (75.6% and 50%, respectively).

Regarding fetal presentation, in all age groups, the majority of the patients during delivery presented with vertex fetal presentation (94.2%, 90.8%, and 89.1% for groups A, B, and C, respectively).

Table (4.5): Distribution of study groups according to complications during delivery.

Complication During Delivery	Group: A(Age<20)		Group: B (Age 20 – 34)		Group: C (Age ≥ 35)	
	No.	(%)	No.	(%)	No.	(%)
Mode Of Delivery						
Vaginal	85	70.8	79	65.8	56	60.9
Caesarean Section (CS)	35	29.2	41	34.2	36	39.1
Type Of CS	N=35		N=41		N=36	
Elective	13	37.1	30	73.2	20	55.5
Emergency	22	62.9	11	26.8	16	44.5
Indication Of CS*	N=35		N=41		N=36	
Fetal Distress	13	37.1	3	7.3	10	27.8
Malpresentation	7	20.0	7	17.1	7	19.4
Previous CS	9	25.7	31	75.6	18	50.0
Contracted Pelvis	6	17.1	0	0	1	2.8
Obstructed Labor	7	20.0	0	0	2	5.6
Others	3	8.6	4	9.8	12	33.3
Fetal Presentation						
Vertex	113	94.2	109	90.8	82	89.1
Breech And Others	7	5.8	11	9.2	10	10.9

* Patients in all groups might had more than one indication of CS, so the percentage is above 100%

4.5. Delivery Outcome

The distribution of study groups according to delivery outcome is shown in table (4.6).

In all groups, most of the study group delivered a live birth (99.2%, 98.3%, and 98.9% for age groups A, B, and C, respectively) and the majority of them delivered babies with normal birth weight (90%, 92.5%, and 83.7% for age groups A, B, and C, respectively).

Regarding admission of newborns to NCU, in all groups, the highest proportion of study patients was delivered babies without admission to NCU (75.8%, 73.3%, and 65.2%) for age groups A, B, and C, respectively).

Table (4.6): Distribution of study groups according to delivery outcome.

Delivery Outcome	Group: A (Age<20) N=120		Group: B (Age 20 – 34) N=120		Group: C (Age ≥ 35) N=92	
	No.	(%)	No.	(%)	No.	(%)
Birth Condition						
Live Birth	119	99.2	118	98.3	91	98.9
Still Birth	1	0.8	2	1.7	1	1.1
Birth Weight						
Low Birth Weight	12	10.0	9	7.5	13	14.1
Normal Birth Weight	108	90.0	111	92.5	77	83.7
Macrosomia	0	0	0	0	2	2.2
Admission To NCU						
No	91	75.8	88	73.3	60	65.2
Yes	29	24.2	32	26.7	32	34.8

4.6. Anemia during pregnancy

The distribution of study groups according to presence of anemia during pregnancy is shown in figure (4.1).

In the three age groups, the highest proportion of study participants had normal hemoglobin level (68.3%, 70%, and 61.9%) for age groups A, B, and C, respectively).

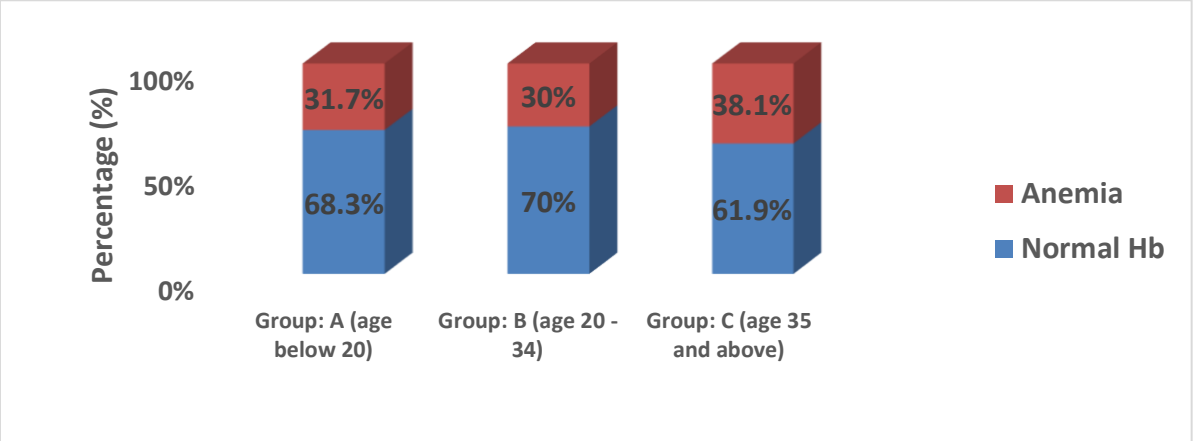

Figure (4.1): Distribution of groups according to presence of anemia during pregnancy.

4.7. Comparison between group: A (age<20) and group: B (age 20 – 34)

4.7.1. Obstetrical data

The comparison between group A and B according to obstetrical data is shown in table (4.7). Regarding Gravida, group B had higher proportion of multigravida (≥ 2) than group A, while group A had higher proportion of primigravida patients than group A and all these differences are statistically significant (P=0.001).

Concerning parity, it was noticed that group A had higher proportion of nulliparous patients than group B, while group B had higher proportion of multiparous (≥1) patients than group A and these differences are statistically significant (P=0.001).

About previous abortions, group A had higher proportion of participants without history of previous abortion than group B, while group B had higher proportion of participants with history of previous one and two abortions and these differences are statistically significant (P<0.05).

It was noticed that in both groups, the majority of participants delivered a full term babies and without history of previous neonatal death with simple differences between these groups which was not statistically significant (P>0.05).

Table (4.7): Comparison between groups A and B by obstetrical data

Obstetrical data	Group: A Age<20		Group: B Age 20-34		Z- test for difference between proportions	P-Value
	No.	(%)	No.	(%)		
Gravida						
Prim gravida	71	59.2	20	16.7	6.785	0.001
Multigravida (2-4)	49	40.8	75	62.5	3.358	0.001
Multigravida≥ 5	0	0	25	20.8	5.282	0.001
Parity						
Nulliparous	78	65.0	26	21.7	6.773	0.001
Multiparous (1-4)	42	35.0	83	69.2	5.297	0.001
Multiparous≥ 5	0	0	11	9.1	3.395	0.001
Previous abortions						
No	111	92.5	89	74.2	3.81	0.001
One abortion	9	7.5	24	20.0	2.811	0.004
Two abortions	0	0	4	3.3	2.016	0.043
More than two abortions	0	0	3	2.5	1.743	0.081
History of previous neonatal deaths						
No	117	97.5	113	94.2	1.292	0.197
Yes	3	2.5	7	5.8		
Gestational age						
Preterm	17	14.2	12	10.0	0.99	0.322
full term	102	85.0	108	90.0	1.171	0.242
Post term	1	0.8	0	0	1.002	0.317

4.7.2. Antenatal Care Data

The comparison between study groups A & B by antenatal care data is shown in table (4.8).Regarding the type of antenatal care visits, higher proportion of group B participants visited private clinics than participants of group A (53.3% versus 25%) and the difference was statistically significant (P=0.001) while group A had higher proportion of participants visited mixed

clinics than group B patients and this differences is also statistically significant (P=0.001).Concerning time of 1st visit, group B had higher proportion of pregnant that visited the clinics for 1st time in the 3rd trimester than group A (22.5% versus 5.8%) and this difference is statistically significant (P=0.001). Group A had higher proportion of participants that visited clinics for 1st time in the 1st trimester than group B (62.5% versus 37.5%) and this difference is also statistically significant (P=0.001).It was noticed regarding no. of visits, there are no statistically significant differences (P≥0.05) between the two groups.

Table (4.8): Comparison between groups A & B by antenatal care data.

Antenatal Care Data	Group: A		Group: B		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
No. Of Visits						
(1 – 2)	**12**	**10.0**	**14**	**11.7**	**0.415**	**0.674**
(3 – 4)	**39**	**32.5**	**41**	**34.2**	**0.273**	**0.787**
(5 And More)	**69**	**57.5**	**65**	**54.1**	**0.519**	**0.603**
Type Of Visit						
Public (Public + PHC)	**24**	**20.0**	**16**	**13.3**	**1.385**	**0.164**
Private Clinic	**30**	**25.0**	**64**	**53.3**	**4.496**	**0.001**
Mixed	**66**	**55.0**	**40**	**33.4**	**3.379**	**0.001**
Time Of 1st Visit						
1st Trimester	**75**	**62.5**	**45**	**37.5**	**3.873**	**0.001**
2nd Trimester	**38**	**31.7**	**48**	**40.0**	**1.346**	**0.177**
3rd Trimester	**7**	**5.8**	**27**	**22.5**	**3.702**	**0.001**

4.7.3. Complications during and after pregnancy

The comparison between study participants in group A & B by complications is shown in table (4.9). Regarding complications during pregnancy, group B had higher proportion of participants that developed gestational DM than group A participants (3.3% versus 0%) and the difference is statistically significant (P=0.043). The other differences between the two groups are not statistically significant (P≥0.05).

Concerning complications after pregnancy the two groups were approaching the same proportion of these complication and the differences between them are not statistically significant (P=0.25).

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Table (4.9): comparison between participants in group A & B by complications.

4.7.4. Complication during delivery

Complication	Group: A		Group: B		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Complication During Pregnancy*						
No Complications	**39**	**32.5**	**42**	**35.0**	**0.409**	**0.681**
GUT Infection	**59**	**49.2**	**60**	**50.0**	**0.129**	**0.896**
Leaking Liquor	**20**	**16.7**	**16**	**13.3**	**0.723**	**0.471**
HTN Disorders Of Pregnancy	**4**	**3.33**	**5**	**4.2**	**0.339**	**0.727**
Antepartum	**1**	**0.8**	**4**	**3.3**	**1.355**	**0.173**
Hemorrhage	**2**	**1.7**	**1**	**0.8**	**0.581**	**0.561**
Medical Disorders	**2**	**1.7**	**3**	**2.5**	**0.451**	**0.652**
Multiple Pregnancy	**0**	**0**	**4**	**3.3**	**2.016**	**0.043**
Gestational DM	**0**	**0**	**1**	**0.8**	**1.002**	**0.317**
Intrauterine Fetal Death	**3**	**2.5**	**4**	**3.3**	**0.383**	**0.703**
Others						
Complication After Pregnancy	**118**	**98.3**	**115**	**95.8**	**1.15**	**0.25**
No	**2**	**1.7**	**5**	**4.2**		
Yes						

The comparison between study participants in group A & B by complications during delivery is shown in table (4.10). It was noticed that there were similar proportions between participants of group A and B regarding mode of delivery (70.8% versus 65.8% respectively) and this difference is statistically not significant (P=0.406).

Group A participants had more proportion of emergency type of CS than group B (62.9% versus 26.8% respectively), this difference is statistically significant (P=0.001).

Concerning indications of CS, there was statistically significant higher proportion of group A participants regarding fetal distress, contracted pelvis and obstructed labor than group B participants (P=0.001, P=0.005 and P=0.002 respectively). While group B patients had higher proportion of those who had previous CS than group A participants (75.6% versus 25.7%) and it is statistically significant (P=0.001).

Table(4.10): Comparison between groups A & B by complication during delivery.

Complication During Delivery	Group: A		Group: B		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Mode Of	N=120		N=120			
Delivery	85	70.8	79	65.8	0.832	0.406
Vaginal	35	29.2	41	34.2		
Caesarean	N=35		N=41			
Section (CS)	13	37.1	30	73.2	3.158	0.001
Type Of CS	22	62.9	11	26.8		
Elective	N=35		N=41			
Emergency	13	37.1	3	7.3	3.179	0.001
Indication Of	7	20.0	7	17.1	0.328	0.741
CS*	9	25.7	31	75.6	4.342	0.001
Fetal Distress	6	17.1	0	0	2.762	0.005
Malpresentation	7	20.0	0	0	3.005	0.002
Previous CS	3	8.6	4	9.8	0.178	0.857
Contracted Pelvis						
Obstructed	113	94.2	109	90.8	0.98	0.327
Labor	7	5.8	11	9.2		
Others						
Fetal						
Presentation						
Vertex						
Breech And						
Others						

4.7.5. Delivery outcome

The comparison between study participants in group A & B by delivery outcome is shown in table (4.11). It was obvious that the differences between proportions of group A and B participants regarding birth condition, birth weight and admission to neonatal care unit was small and statistically not significant (P≥0.05).

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Table (4.11): comparison between groups A & B by delivery outcome.

Delivery Outcome	Group: A		Group: B		Z- Test For Difference Between Proportions	P-Value
	No.	(%)	No.	(%)		
Birth Condition						
Live Birth	**119**	**99.2**	**118**	**98.3**	**0.581**	**0.561**
Still Birth	**1**	**0.8**	**2**	**1.7**		
Birth Weight						
Low Birth Weight	**12**	**10.0**	**9**	**7.5**	**0.685**	**0.49**
Normal Birth Weight	**108**	**90.0**	**111**	**92.5**		
Admission To NCU						
No	**91**	**75.8**	**88**	**73.3**	**0.444**	**0.659**
Yes	**29**	**24.2**	**32**	**26.7**		

4.7.6. Anemia of pregnancy

The comparison between study participants in group A & B by anemia of pregnancy is shown in table (4.12). not significant (P=0.779).

Table(4.12): comparison between groups A & B by anemia of pregnancy.

Hemoglobin Condition	Group: A		Group: B		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Normal	**82**	**68.3**	**84**	**70.0**		
Anemia	**38**	**31.7**	**36**	**30.0**	**0.279**	**0.779**

4.8. Comparison between group: C (age ≥ 35) and group: B (age 20 – 35)

4.8.1. Obstetrical data

The comparison between study participants in groups C and B according to obstetrical data is shown in table (4.13).

It was noticed that group B had higher proportion of participants who were multigravida (2-4) than group C (62.5% versus 37% for group B and C, respectively), while group C had higher proportion of participants who were multigravida (≥5) than group B (54.3% versus 20.8% for group C and B respectively), and these differences are statistically significant (P=0.001).

Regarding parity, group B had higher proportion of participants who were nulliparous than group C (21.7% versus 10.9%), while group C had higher proportion of patients who were multiparous (≥5) than group B (30.4% versus 9.1%), and these differences are statistically significant (P<0.05).

It was noticed that group B had higher proportion of participants who had previous history of one abortion than group C (20% versus 7.6%), and the difference is statistically significant (P=0.011).

Concerning gestational age, group C had higher proportion of participants who were post term than group B (3.3% versus 0) and the difference is statistically significant (P=0.046). Other differences between participants of the two groups are statistically not significant (P≥0.05).

Table(4.13): Comparison between groups C and B by obstetrical data

Obstetrical Data	Group: C N=92		Group: B N=120		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Gravida						
Prim Gravida	**8**	**8.7**	**20**	**16.7**	**1.698**	**0.089**
Multigravida (2-4)	**34**	**37.0**	**75**	**62.5**	**3.688**	**0.001**
Multigravida ≥ 5	**50**	**54.3**	**25**	**20.8**	**5.058**	**0.001**
Parity						
Nulliparous	**10**	**10.9**	**26**	**21.7**	**2.075**	**0.037**
Multiparous (1-4)	**54**	**58.7**	**83**	**69.2**	**1.58**	**0.114**
Multiparous ≥ 5	**28**	**30.4**	**11**	**9.1**	**3.961**	**0.001**
Previous Abortions						
No	**75**	**81.5**	**89**	**74.2**	**1.268**	**0.204**
One Abortion	**7**	**7.6**	**24**	**20.0**	**2.53**	**0.011**
Two Abortions	**7**	**7.6**	**4**	**3.3**	**1.391**	**0.164**
More Than Two Abortions	**3**	**3.3**	**3**	**2.5**	**0.331**	**0.741**
History Of Previous Neonatal Deaths						
No						
Yes	**88**	**95.7**	**113**	**94.2**	**0.483**	**0.631**
Gestational Age	**4**	**4.3**	**7**	**5.8**		
Preterm						
Full Term	**10**	**10.9**	**12**	**10.0**	**0.205**	**0.833**
Post Term	**79**	**85.9**	**108**	**90.0**	**0.924**	**0.357**
	3	**3.3**	**0**	**0**	**1.992**	**0.046**

4.8.2. Antenatal care data

The comparison between study participants in group B & C by antenatal care data is shown in table (4.14).Regarding no. of visits, group C had higher proportion of participants that had one or two visits than group B (22.8% versus 11.7%) and this difference is statistically significant (P=0.03).

Concerning type of visits, group C had higher proportion of participants who visited public clinics than group B participants (30.4% versus 13.3%) and this difference is statistically significant (P=0.002), while the proportion of participants who visited private clinics was higher in group B than in group C (53.3% versus 35.9%) and this difference is statistically significant (P=0.011).It was noticed that there were no significantdifferencesinproportion between group B & C participants regarding the time of 1st visit to antenatal care clinics (P≥0.05).

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Table (4.14): Comparison between groups B & C by antenatal care data.

Antenatal Care Data	Group C (N=92)		Group B (N=120)		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
No. Of Visits						
(1 – 2)	21	22.8	14	11.7	2.169	0.03
(3 – 4)	36	39.1	41	34.2	0.744	0.459
(5 And More)	35	38.1	65	54.1	2.33	0.019
Type Of Visit						
Public (Public + PHC)						
Private Clinic	28	30.4	16	13.3	3.043	0.002
Mixed	33	35.9	64	53.3	2.529	0.011
Time Of 1st Visit	31	33.7	40	33.4	0.055	0.952
1st Trimester						
2nd Trimester	44	47.8	45	37.5	1.509	0.131
3rd Trimester	30	32.6	48	40.0	1.106	0.267
	18	19.6	27	22.5	0.517	0.603

4.8.3. Complications during and after pregnancy

The comparison of study participants in group C & B by complication during and after pregnancy is shown in table (4.15). Regarding the complications during pregnancy, group C had higher proportion of participants who had HTN disorders of pregnancy and medical disorders than group B. These differences were statistically significant ($P<0.05$), and the other differences are not statistically significant even those regarding complications after pregnancy ($P\geq0.05$).

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(4.15): Comparison of groups C & B by complication during and after pregnancy.

Complication	Group: C N=92		Group: B N=120		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Complication During Pregnancy*						
No Complications						
GUT Infection	23	25.0	42	35.0	1.565	0.116
Leaking Liquor	34	37.0	60	50.0	1.894	0.058
HTN Disorders Of Pregnancy	9	9.8	16	13.3	0.794	0.429
Antepartum Hemorrhage						
Medical Disorders	11	12.0	5	4.2	2.128	0.033
Multiple Pregnancy	5	5.4	4	3.3	0.752	0.453
Gestational DM	9	9.8	1	0.8	3.046	0.002
Intrauterine Fetal Death	7	7.6	3	2.5	1.738	0.081
Others	2	2.2	4	3.3	0.504	0.617
Complication After Pregnancy	1	1.1	1	0.8	0.189	0.849
No	8	8.7	4	3.3	1.674	0.094
Yes						
	87	94.6	115	95.8	0.431	0.667
	5	5.4	5	4.2		

4.8.4. Complications during delivery

The comparison between study participants in group B & C by complication during delivery is shown in table (4.16). It was noticed that there were no statistically significant differences in proportion between participants in group B & C regarding mode of delivery, type of CS and fetal presentation ($P \geq 0.05$).

Regarding indications of CS, group C had higher proportion of participants presented with fetal distress and other complication than group B, while group B had higher proportion of participants who had previous CS than group C and these differences are statistically significant ($P < 0.05$).

Table (4.16): Comparison between groups B & C by complication during delivery.

Complication During Delivery	Group: C		Group: B		Z- Scale For Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Mode Of Delivery						
Vaginal	56	60.9	79	65.8	0.744	0.459
Caesarean Section (CS)	36	39.1	41	34.2		
Type Of CS	N=36		N=41			
Elective	20	55.5	30	73.2	1.616	0.105
Emergency	16	44.5	11	26.8		
Indication Of CS*	N=36		N=41			
Fetal Distress	10	27.8	3	7.3	2.391	0.011
Malpresentation	7	19.4	7	17.1	0.269	0.787
Previous CS	18	50.0	31	75.6	2.33	0.019
Contracted Pelvis	1	2.8	0	0	1.074	0.28
Obstructed Labor	2	5.6	0	0	1.529	0.126
Others	12	33.3	4	9.8	2.544	0.011
Fetal Presentation						
Vertex	82	89.1	109	90.8	0.411	0.681
Breech And Others	10	10.9	11	9.2		

4.8.5. Delivery outcome

The comparison between study participants in group B & C by delivery outcome is shown in table (4.17). It was obvious that there were no statistically significant differences in proportion between participants in the two groups concerning birth condition and admission of neonates to NCU (P≥0.05). The only statistically significant difference (P=0.044) in proportion between group B & C participants that regarding birth weight when group B had higher proportion of participants who delivered babies with normal birth weight than group C (92.5% versus 83.7%).

Table (4.17): Comparison between groups B & C by delivery outcome.

Delivery Outcome	Group: C		Group: B		Z- Scale for Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Birth Condition						
Live Birth	**91**	**98.9**	**118**	**98.3**	**0.354**	**0.726**
Still Birth	**1**	**1.1**	**2**	**1.7**		
Birth Weight						
Low Birth Weight	**13**	**14.1**	**9**	**7.5**	**1.568**	**0.116**
Normal Birth Weight	**77**	**83.7**	**111**	**92.5**	**2.005**	**0.044**
Macrosomia	**2**	**2.2**	**0**	**0**	**1.622**	**0.105**
Admission To NCU						
No	**60**	**65.2**	**88**	**73.3**	**1.275**	**0.2**
Yes	**32**	**34.8**	**32**	**26.7**		

4.8.6. Anemia of pregnancy

The comparison between study participants in group B & C by anemia of pregnancy is shown in table (4.18). Group C had higher proportion of anemic participants than group B (38.1% versus 30%) but this difference is statistically not significant (P=0.218).

Table (4.18): Comparison between groups B & C by anemia of pregnancy.

Hemoglobin Condition	Group: C		Group: B		Z- Scale for Difference Between Groups	P-Value
	No.	(%)	No.	(%)		
Normal	**57**	**61.9**	**84**	**70.0**	**1.229**	**0.218**
Anemia	**35**	**38.1**	**36**	**30.0**		

Discussion

In this study, different risks associated with child bearing were examined between adolescent, young adult and older age mothers.

Teenage and young adult mothers

In this study, the prevalence of delayed prenatal visit was higher in young adult mothers than teenage mothers. This result was in contrast with result found by Thato et al, 2007 study [133], and Amini et al, 1996 study [134] when they showed that a characteristic pattern seen among many teenagers is their failure to seek prenatal care. They also reported that compared with adult pregnant women, pregnant teenagers were less likely to have adequate prenatal care. The detection of treatable medical conditions, the passion of appropriate medical management and follow up can be done if younger mothers have early prenatal care. Teenage pregnancy in developed countries usually occurs outside marriage, and in many communities and cultures carries a social stigma. In other countries and cultures, particularly in the developing world, teenage pregnancy is often within marriage and does not involve social

stigma. [135]In this study, the majority of the adolescents were over 18 years of age (42.4%), followed by age 15 - 18 years (34.7%). They were married, and most lived with their husbands or parents. These girls tended to fall into the group who attended several times for antenatal care. Teenage mother visited private and public outlets (hospital and primary health care centers) significantly more than adult mother because most of teenage mother are primigravida, had less experience, afraid from pregnancy, to get tetanus toxoid in public clinic and to get ultrasound examination.

In the current study, it was found that young adult mothers had higher prevalence of gestational DM than teenager mothers. Similar results were found by Jolly et al, 2000 study. This might be explained by the fact that pancreatic B cell function and insulin sensitivity decrease with age. Older women with a predisposition to type II diabetes are more likely to have inadequate B cell responses to stimulation and be more insulin-resistant than teenage women (Jolly et al, 2000).[136]

Unlike other studies conducted in Nigeria by Ayuba et al; 2012[137], Fraser et al; 1995[138], Lao et al, 1998[139], and Gadowsky et al, 1995[140], the result of this study demonstrated that the adolescent mothers were not at higher risk for delivering infants that weighed ≤2500gm. The rates of low birth weight babies in the teenage mothers and adult mothers were similar to results found by Jolly et al, 2000 study[136] and Thato et al, 2007[133] study in which they also couldn't find this association. The lower rate of delivering low birth weight babies among teenage mothers was possibly due to that our society take care more to pregnant women especially primigravida women and also due to an increased rate of adequate prenatal care when 90% of teenage mothers in this study visited prenatal clinic three times or more. Adequate prenatal care could lower the incidence of low birth weight since poor outcome seems to be more related to social conditions than biology of young mothers (Jolly et al, 2000).[136]

Regarding admission of babies to Neonatal Care Unit, in the current study, the admission rate to Neonatal Care Unit was about the same between the infants born to teenage and adult mothers. The same finding was shown by Thato et al, 2007 study[136]. The possible reason may be attributed to adequate prenatal care in the study population. Most pregnant teenagers visited prenatal clinics three times or more.

The current study showed that the adolescents had a significantly higher rate of normal vaginal delivery and a lower caesarean section rate compared with the adult group which is the same with other study [141] and contrasts with other studies [142-144]. It has been postulated that the young adolescent is at increased risk for cephalopelvic disproportion because the bony pelvis has not yet reached its full size. However, the majority of the teenagers in this study were not young adolescents but late teenagers with full bone maturity, which could explain the lower caesarean section rate in the study group compared with adult pregnancy. Recent studies have not supported the assumption that teenage pregnancy is associated with adverse outcome. [139,145,146].

In the current study, teenage mothers had higher prevalence of emergency than elective caesarean sections more than young adult mothers. Similar findings were found in Nigeria by Ayuba et al; 2012 study [137], Ebeigb et al; 2007 study. [147] This might be due to the fact that

many times, those women may remain in labor for more than 24 hours at other centers and often referred late with varied reasons. .

Old age and young adult mothers

In this study, the results showed that both younger and older pregnant women didn't show an increase odds of preterm delivery, still birth, low birth weight, admission of baby to Neonatal Care Unit, or severe preeclampsia during pregnancy. Women over 35 years are prepared for pregnancy, gathered information, received information from healthcare providers, and worried about their pregnancy and their status of being "at risk". Nevertheless, these women also experienced positive feelings.

One of the major difficulties to address is that while these women want to be as well-informed and prepared as possible, the information they receive can cause more anxiety rather than alleviate their concerns [148].

It is important to remember that most women of advanced age give birth, at term, without experiencing adverse maternal or prenatal outcomes [149]. Furthermore, the fact that absolute rates of prenatal mortality/morbidity are low, suggests that the majority of older women do have a desirable outcome to their pregnancy [150]. Delayed antenatal care visit to private and public outlets (hospital and primary health care centers) are significantly more for advanced maternal aged mother than for young mother. This may be due to the fact that most of them are multigravida and they have more experience in pregnancy and delivery and they went to antenatal care only when they had complications.

Most studies of pregnancy outcomes among women in their forties and fifties have focused on neonatal outcomes or relatively common maternal medical conditions such as diabetes and hypertension [151].

In this study, mothers aged ≥35 years suffered from pregnancy induced hypertension significantly higher than young adult mothers. Similar result was found by Timofeev et al, 2013[152] in their study in the US when they showed that the risk of pregnancy-induced hypertension was 1.22 times higher for mothers who were 35–39.9 years old, 1.63 times higher for mothers 40–44.9 years old and 1.89 times higher for mothers ≥45 years old compared to the reference group (25–29.9 years old). Dietl et al, 2015[153] study also found the same result. Even if there is a correlation between advanced maternal age and pregnancy-induced hypertension, for most pregnancies this has very little impact on pregnancy outcome, although it does increase the risk of other complications like preeclampsia [154]. The result of this study goes with a study done in Basrah Maternity and Child hospital, 2008 [155] and a study done by Aghamohammed, 2011, in Iran who also found that preeclampsia increases with increased maternal age [156].

The incidence of chronic hypertension increase with age and it is possible for vascular impairment inherent to age rendering some women more susceptible to pregnancy-induced hypertension, even those who do not develop clinically recognized hypertension. Additionally, pre-eclampsia is more frequently reported at the extremes of reproductive age especially among older women. [157,158]. The finding of this study that the medical disorders are significantly more common with advanced maternal age is in agreement with Namavar et al. and Gold man et al., Al Mhfooth study in Basra, 2013[159]. Studies showed that higher

incidence of maternal medical disease such as hypertensive disorder and diabetes were seen among advanced aged mother more than among the young mother [160,161].

In the current study, the preterm birth rate was similar across the study groups (young and older age groups), and even early neonatal mortality was not higher in the children born to older mothers. Similar results were found by Dietl et al[162], study while in the Canadian study by Kanungo et al, 2011[163] when they reported that preterm neonates born to women with advanced maternal age had better odds of survival without major morbidities and a decreased risk of mortality. The possible explanation is that older mothers tend to deliver electively, regularly attend prenatal check-ups, and protect themselves from possible complications of pregnancy. On the contrary, Gill et al, 2016 study[164] reported on neonatal outcomes among 3,953 pregnant women aged 40 and older and found that these women had increased risk for fetal death, preterm delivery, and low birth weight compared to women under 35. Also in a study of 539 deliveries to women aged 50 and older, Salihu et al, 2003[165] found that pregnancy in women aged 50 and older was associated with preterm delivery and low birth weight compared with women under 30.

This study found an increase in the rate of both elective and emergency caesarean delivery in women aged 35 years and more. This is in line with the findings of other studies such as Bell et al, 2001[166] and Kenny et al, 2013[167]. Karlström et al, 2011(Sweden) also found a two to four times higher rate of cesarean sections in older pregnant women compared to the reference group (< 25 years old) (OR 4.42 for age > 35 years and 2.05 for 25–35 years of age). The possible explanation for this result is that trends of caesarean section for older women appear to be related to concerns for fetal welfare (Karlström A. et al, 2011[168]). Emergency caesarean section was more for advanced maternal age than the elective caesarean section, which was more for young women but, it is not significant[169]. The main reason for the high caesarean section rate in the young group is related to previous caesarean section deliveries (cumulative effect of C\S). Caesarean section rates are increasing recently in many countries [170]. Fetal distress is one of the indication for caesarean section, which constituted 27.8% for advanced age and 7.3% for young mother which is the same result to Ates S. et al, 2013 study in Turkey [169]. This may be due to complication during pregnancy and delivery (midwife intervention, hypertension, fetal macrosomia, medical disorder and bleeding). This might suggest that management decisions, both electively and in labor, have an important impact on cesarean section rates. They may reflect maternal preferences, obstetrician preference or a lowering of the threshold for risk avoidance [171].

Limitations of the study

Some important limitations should be considered when interpreting the results of the study.

- First, lack of information on medical interventions, including fertility treatments and quality of antenatal care.
- Second, since the study was conducted in hospitals where maternal and neonatal care facilities are available the findings may not directly reflect the situation in the general population.

Conclusions& Recommendations

Conclusions

1. The risk of obstetric complications was no higher in adolescents than in adult women.
2. Adolescent mother tend to visit antenatal care (both public and private) more than and at early stage of pregnancy than the adult women. Adult women tend to visit private clinics more than public health outlets.
3. Women aged 35 year or more had delayed antenatal care and less numbers of visits than younger women
4. Women aged 35 year or more had higher proportion of complications during pregnancy like hypertension disorder of pregnancy, medical disorders and to be more prone to caesarean section especially emergency caesarean section.
5. No association found between some important outcomes such as antepartum hemorrhage, postpartum hemorrhage, premature delivery, still birth and neonatal care admission and maternal age.

Recommendations

The women in our society need for more education about the importance of timely and completed antenatal care visits. family physician should play a pivotal role of in this arena.
Increase awareness of older women about the risks associated with delayed child bearing; they can make informed decision on when to start their family.
Activation the role of pre pregnancy clinic for such high risk age group.
Future community based studies are recommended to reach women in the general public who may deliver outside the hospitals.

References

(1) Unicef. World population day. Plan your future, plan your famlies. July11, 2008.
(2) Kost K, Henshaw S, Carlin L.U.S. TeenagePregnancies, Births and Abortions, National and State Trends by Age, Race and Ethnicity. 2014.
(3) Locoh T. Early marriage and motherhood in sub-Saharan Africa. African Environment 1999; 10(3): 31-42.
(4) Mehta S, Groenen R, Roque F. Adolescents in changing times: issues and perspectives for adolescent reproductive health in the ESCAP region. United Nations Economic and Social Commission for Asia and the Pacific. 2012.
(5) Fog A. Cultural selection. Kulwer Academic Publications, 1999.P. 254.
(6) UNICEF. A league Table of teenage births in rich nations. Issue No 3. 2001.
(7) Moore AK, Miller BC, Sugland BW, Morrison DR, Glei DR, Blumenthal DA. Bebinning too soon: Adolescent sexual behavior, pregnancy and parenthood. Child Trends Inc. 1995.
(8) Guttmacher Institute. Sex and Relationships. Retrieved August 8, 2006.
(9) Darroch JE, Frost JJ, Singh S. Teenage sexual and reproductive behavior in developed counteries. Can more progress be made? The Alan Guttmacher Institute. New York and Washington, DC. 2001.
(10) East PL. Do adolescent pregnancy and childbearing affect younger siblings? Family Planning Perspectives, 1996; 28 (4): 148-153.
(11) Wyshack G, Frisch RE. Evidence for a secular trend in age of menarche. N Engl J Med 1982; 306: 1033-35.
(12) McCauley AP, Salter C, Kiragu K, Senderowitz. Meeting the needs of young adults. Popul Rep J 1995; 10(41): 1-43.

(13) Guttmacher Institute In Their Own Right: Addressing the Sexual and Reproductive Health Needs of Men Worldwide.www.guttmatcher.org. Archived report 2003. pp. 19-21.

(14) Grunbaum JA, Kann L. Kinchen SA. Williams B et al. Youth risk behavior surveillance-United States, 2001. Centers for Disease Control and Prevention Morbidity and Mortality. Weekly Report June 28, 2002 ;51(SS04);1-64

(15) Kaiser Family Foundation. U S teen sexual activity.http://web.archive.org/web/20080216015345/http:/www.kff.org/youthhivstds/upload/U-S-Teen-Sexual-Activity-Fact-Sheet.pdf. 2005.

(16) Besharov D J, Gardiner K N. Trends in Teen Sexual Behavior. Children and Youth Services Review. 1997:19 (5–6): 341–367.

(17) Sax L. Why Gender Matters: What parents and teachers need to know about the emerging science of sex differences. Doubleday books, Random House Inc., 2005: p. 128.

(18) Trani F, Gnisci F, Nobile CG, Angelillo IF. Adolescents and sexually transmitted infections: Knowledge and behaviour in Italy, J Paediatr Child Health 2005; 41: 260-64.

(19) The National Campaign to Prevent Teen Pregnancy. What the Polling Data Tell Us: A Summary of Past Surveys on Teen Pregnancy. teenpregnancy.org. 1997.

(20) Slater J. Britain: Sex Education Under Fire. The Courier. July/August 2000. http://web.archive.org/web/20070703000657/http:/www.unesco.org/courier/2000_07/uk/apprend.htm

(21) SpeidelJJ, Harper CC, Shields WC. The potential of long-acting reversible contraception to decrease unintended pregnancy. Contraception 2008; 78 (3): 197-200.

(22) Trussell J, Wynn LL. Reducing unintended pregnancy in the United States. Contraception 2008; 77 (1): 1–5.

(23) Colabianchi N. Teen Pregnancy. In: Loue S, Sajatovic M (Eds.). Encyclopedia of Women's Health. Springer. New York. 2004.PP. 1288-1290.

(24) QuinlivanJTeenage pregnancy. Obstetrics and Gynecology 2006; 8 (2): 25–6.

(25) Hsu G. Statutory rape. Family Research Council. http://jkalb.freeshell.org/misc/statutory.html.

(26) SaewycEM, Magee LL, Pettingell SE. Teenage pregnancy and associated risk behaviors among sexually abused adolescents. Perspectives on Sexual and Reproductive Health, 2004; 36 (3): 98-105.

(27) Science Blog. Childhood sexual abuse, teen pregnancy. University of Southern California,.http://www.scienceblog.com/community. 2004.

(28) Speizer I S, Pettifor A, Cummings S, MacPhail C, Kleinschmidt I, Rees H V. Sexual violence and reproductive health outcomes among South African female youths: A contextual analysis. American Journal of Public Health 2009. 99 (Suppl 2): S425–31.

(29) Cullinan K. Teen mothers often forced into sex. www.csa.za.org. November, 2003.

(30) Aquino EM, Heilborn ML, Knauth D, Bozon M, Almeida MC, Araújo J et al. Adolescência e reprodução no Brasil: a heterogeneidade dos perfissociais. Cad SaudePublica 2003;19 (Supl 2):S377-88.

(31) Pallitto CC, Murillo V. Childhood abuse as a risk factor for adolescent pregnancy in El Salvador. J Adolesc Health 2008;42 (6): 580-6.

(32) Smith C. The link between childhood maltreatment and teenage pregnancy. Social Work Research 1996; 20 (3): 131–141.

(33) Tamkins T. Teenage pregnancy risk rises with childhood exposure to family strife. Perspectives on Sexual and Reproductive Health, March/April 2004.

(34) Ellis BJ, Bates JE, Dodge KA, Fergusson DM, HorwoodLJ, Pettit GS, Woodward L. Does father absence place daughters at special risk for early sexual activity and teenage pregnancy? Child Development 2004; 74 (3): 801–821.

(35) Quigley A. Father's Absence Increases Daughter's Risk of Teen Pregnancy. Health Behavior News Service. May 2003.

(36) Furstenberg FF, Levine JA, Brooks-Gunn J. The children of teenage mothers: patterns of early childbearing in two generation. FamPlannPerspect 1990; 22 (2): 54–61.

(37) East PL, Jacobson LJ. The younger siblings of teenage mothers: a follow-up of their pregnancy risk. Dev Psychol 2001; 37 (2): 254–64.

(38) L'EngleKL, Brown JD, Kenneavy K, Brown, Jane D, Kenneavy K. The mass media are an important context for adolescents' sexual behavior. Journal of Adolescent Health 2006; 38 (3): 186-192.

(39) Mangiaterra V, Pendse R, McClure K, Rosen J. MPS Notes: Adloescent pregnancy. WHO. Department of making pregnancy safer, October 2008.Vol. 1, No. 1.

(40) Unicef. A League Table of Teenage Births in Rich Nations.https://www.unicef-irc.org/publications/328/.2001.

(41) Mayor S. Pregnancy and childbirth are leading causes of death in teenage girls in developing countries. BMJ 2004; 328 (7449): 1152.

(42) Treffers PE. Teenage pregnancy, a worldwide problem. Nederlandstijdschriftvoorgeneeskunde 2003; 147 (47): 2320-2325.

(43) Dawan H. Teen pregnancies higher in India than even UK, US. The Economic times. November 28, 2008.

(44) Centers for Disease Control and Prevention. Morbidity and mortality weekly report MMWR. Health Disparities and Inequality Report – United States. Supplement Volume 60. U.S. Department of health and Human Service. January 14,2011.

(45) Guttmatcher Insitiute. U.S. Teenage Pregnancy Rate Drops For 10th Straight Year. News Release. March 30,2004.

(46) Better Health Channel. Teenage pregnancy. Victoria State Government. Department of Health and Human Service. Australia.https://www.betterhealth.vic.gov.au/health/healthyliving/teenage-pregnancy. April 20015.

(47) Dryburgh, H. Teenage pregnancy. Statistics Canada Catalgue. Health Reports, Vol. 12 No. 1. http://www.statcan.gc.ca/pub/82-003-x/2000001/article/5299-eng.pdf

(48) Bielski Z. Why teen pregnancy is on the rise again in Canada (and spiking in these provinces). The Globe and Mail.http://www.theglobeandmail.com/life/health-and-fitness/health/why-teen-pregnancy-is-on-the-rise-again-in-canada-and-spiking-in-these-provinces/article7927983/. January 29, 2013.

(49) HashimTJ, Anokute CC. Imbalances in perinatal mortality in health regions of Saudi Arabia. Saudi Med J 1994; 15: 376-379.

(50) Mesleh RA, Al-Aql AS, Kurdi AM; Teenage Pregnancy, Saudi Med J 2001; 22 (10): 864-867.

(51) The World Bank, IBR. IDA. Adolecent fertility rate (birth per1,000 women age 15-19). http://data.worldbank.org/indicator/SP.ADO.TFRT. Accessed 2016.

(52) Singh S, Darroch JE. Adolescent pregnancy and childbearing: levels and trends in developed countries. FamPlannPerspect 2000. Jan/Feb; 32(1):14-23.

(53) Roudi-Fahimi F, Ibrahim S. Ending child marriage in the Arab region. http://www.prb.org/pdf13/child-marriage-arab-region.pdf. May 2013.

(54) Abalkhail BA (1995). Adolescent pregnancy: Are there biological barriers for pregnancy outcomes? The Journal of the Egyptian Public Health Association 1995; 70 (5–6): 609-625.

(55) Institute of Education Sciences ERIC. Not Just Another Single Issue: Teen Pregnancy Prevention's Link to Other Critical Social Issues.National Campaign To Prevent Teen Pregnancy, Washington, DC. https://eric.ed.gov/?id=ED462522. Accessed 2016.

(56) Seitz V, Apfel N H. Adolescent mothers and repeated childbearing: Effects of a school-based intervention program. The American journal of orthopsychiatry 1993; 63 (4): 572-81.

(57) Hofferth SL, Reid L, Mott FL. The effects of early childbearing on schooling over time. Family Planning Perspectives 2001; 33 (6): 259–267.

(58) O'Halloran P. Pregnancy, Poverty, School and Employment. http://www.moappp.org/Documents/pregnancypovertyschoolandemployment.pdfmoappp.org. April 1998.

(59) Teenage Pregnancy. Presented to parliament by the prime minster. http://dera.ioe.ac.uk/15086/1/teenage-pregnancy.pdf. June 1999.

(60) Clemmens D. Adolescent mother's depression after the birth of their babies: weathering the storm. Adolescence 2002; 37(143): 551-65.

(61) Child Trends. Conceptualizing a "Strong Start": Antecedents of Positive Child Outcomes at Birth and Into Early Childhood. https://www.childtrends.org/publications/conceptualizing-a-strong-start-antecedents-of-positive-child-outcomes-at-birth-and-into-early-childhood/. February2007.

(62) The Psychological Effects of Teenage Women During Pregnancy. http://sean-c-powers.com/TeenagePregnancy.html. Retrieved January, 2009.

(63) National Campaign to Prevent Teen Pregnancy and unplanned pregnancy. Statistics on Teen Pregnancy.

(64) Cornelius MD, Goldschmidt L, Willford JA, Leech SL et al. Body size and intelligence in 6-year old: are offspring of teenage mother at risk? Maternal and Child Health Journal 2009; 13 (6): 847-856.

(65) New York State Department of Health, Public Health Information Group.

(66) Personal communication to Diane Mastin from New York State Office of Children and Family Services. 2006.

(67) Gibbs CM, Wendt A, Peters S, Hogue CJ. The impact of early age at first childbirth on maternal and infant health. PaediatrPerinatEpidemiol 2012; 26 (Suppl 1): 259-84.

(68) American Academy of Pediatrics: Care of adolescent parents and their children. Pediatrics 2001; 107 (2): 429-34.

(69) Hofferth SL, Reid L. Early Childbearing and Children's Achievement And Behavior over Time. Perspectives on Sexual and Reproductive Health 2002; 34 (1): 41-49.

(70) Hoffman SD, Maynard RA. (Eds.).Kids Having Kids: ecomonic cost and social consequences of teen pregnancy. The Urban Institute Press, Washington D.C. 2008.

(71) Gilbert W, Jandial D, Field N, Bigelow P et al. Birth outcomes in teenage pregnancies, J Matern Fetal Neonatal Med 2004; 16: 265-70.

(72) Jolly MC, Sebire N, Harris J, Robinson HS, Regan L.Obstetric risk of pregnancy in women less than 18 years old. ObstetGynecol 2000; 96: 962-66.

(73) Gortzak-Uzan L, Hallak M, Press F, Katz M et al. Teenage pregnancy: risk factors for adverse perinatal outcome. J Matern Fetal Med 2001; 10: 393-97.

(74) Igwegbe AO, Udigwe GO. Teenage pregnancy: still an obstetric risk. J ObstetGynaecol 2001; 21: 478-81.

(75) Bacci A, Manhica GM, Machungo F, Bugalho A et al. Outcome of teenage pregnancy in Maputo, Mozambique. Int J GynaecolObstet 1993; 40: 19-23.

(76) Satin AJ, Leveno KJ, Sherman ML, Reedy NJ et al. Maternal youth and pregnancy outcome: middle school versus high school age groups compared with women beyond teen years. Am J ObstetGynecol 1994;171: 184-87.

(77) Bukulmez O, Deren O. Perinatal outcome in adolescent pregnancies: a case-control study from a Turkish university hospital. Eur J ObstetGynecolReprodBiol 2000; 88: 207-12.

(78) Olausson PM, Cnattingius S, GoldenberyRL. Determinants of poor pregnancy outcomes among teenagers in Sweden. ObstetGynecol 1997; 89: 451-57.

(79) Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. N Engl J Med 1995; 332:1113-17.

(80) Conde-Agudelo A, BelizanJM, Lammers C. Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: cross-section study. Am J ObstetGynecol 2005; 192: 342-49.

(81) Smith GCS, Pell JP. Teenage pregnancy and risk of adverse perinatal outcomes associated with first and second births: population based retrospective cohort study. Br Med J 2001; 323: 476-79.

(82) Olausson PO, Cnattingius S, Haglund B. Teenage pregnancies and risk of late fetal death and infant mortality. BJOG 1999; 106: 116-21.

(83) Zabin LS, Kiragu K. The health consequences of adolescent sexual and fertility behaviour in sub-Saharan Africa. Stud FamPlann 1998; 29: 210-32.

(84) Makinson C. The health consequences of teenage fertility. Family Planning Perspectives 1985; 17 (3): 132–139.

(85) Guttmacher Institute. Teen Sex andPregnancy.https://www.guttmacher.org/pubs/fb_teen_sex.html. September 1999.

(86) Gutierrez Y, King JC. Nutrition during teenage pregnancy. Pediatric annals 1993; 22 (2): 99–108.
(87) Sanchez PA, Idrisa A, BobzomDN, Airede A et al. Calcium and vitamin D status of pregnant teenagers in Maiduguri, Nigeria. Journal of the National Medical Association 1997; 89 (12): 805-811.
(88) Peña E, Sánchez A, Solano L. Profile of nutritional risk in pregnant adolescents. Archivos latinoamericanos de nutricion 2003; 53 (2): 141-149.
(89) UNFPA-United Nations Populations Fund Adolescent pregnancy.http://www.unfpa.org/adolescent-pregnancy. Retrieved April 2016.
(90) Santelli J, Lindberg L, Finer L, Singh S. Explaining Recent Declines in Adolescent Pregnancy in the United State: The Contribution of Abstinence and Improved Contraceptive Use. American Journal of Public Health 2007; 97(1): 150-156.
(91) Valk G. The Dutch Model. In: Youth's sonic forces. The Courier, July/August 2000; 53 (7): 19.
(92) Ott MA, Santelli JS. Abstinence and abstinence-only education. Current opinion in obstetrics & gynecology 2007; 19 (5): 446-52.
(93) Underhill K, Operario D, Montgomery P.Systematic review of abstinence-plus for HIV prevention in high-income countries. PLoS Med 2007; (4)9: e275.
(94) The National Campaign to Prevent Teen and Unplanned Pregnancy. "Policy Brief: Title X Plays a Critical Role in Preventing Unplanned Pregnancy" (PDF). Retrieved 15 February 2011.
(95) Fretts RC. Effect of advanced age on fertility and pregnancy in women. UpToDate.http://www.uptodate.com/contents/effect-of-advanced-age-on-fertility-and-pregnancy-in-women
(96) Bianco A, Stone L, Lynch R, Lapinski R, Berkowitz G, Berkowitz RL. Pregnancy outcome at age 40 and older. Obstet. Gynecol 1996; 87: 917-22.
(97) Mills M, Rindfuss RR, McDonald P, teVelde E, ESHRE Reproduction and Society Task Force. Why do people postpone parenthood? Reasons and social policy incentives. Hum Reprod Update 2011; 17(6):848-60.
(98) Cooke A, Mills TA, Lavender T.Advanced maternal age: delayed childbearing is rarely a conscious choice a qualitative study of women's views and experiences.Int J Nurs Stud 2012; 49(1):30-9.
(99) The Sydney Morning Herald. Woman, 61, pregnant. http://www.smh.com.au/world/woman-61-pregnant-20110926-1ktkg.html. September 27, 2011.
(100) Huang L, Sauve R, Birkett N, Fergusson D et al. Maternal age and risk of stillbirth: a systematic review. CMAJ 2008; 178: 165-172.
(101) Mathews T, Hamilton B. Mean age of mother, 1970–2000. National Vital Statistics Reports, Vol. 50 No. 1. Hyattsville, Maryland: National Center for Health Statistics. 2002.
(102) Martin J, Hamilton B, Sutton P, Ventura S et al. Births: Final data for 2006. National Vital Statistics Reports, Vol. 57 No. 7. Hyattsville, Maryland: National Center for Health Statistics. 2009.
(103) Martin J, Hamilton B, Ventura S, Osterman M et al. Births: Final Data for 2009. National Vital Statistics Reports Vol. 60 No. 1. Hyattsville, Maryland: National Center for Health Statistics. 2011.
(104) Eurostat. Statistics Explaned. Fertility statistics. http://ec.europa.eu/eurostat/statisticsexplained/index.php/Fertility_statistics. March 2017.
(105) Leridon H. Can assisted reproduction technology compensate for the natural decline in fertility with age? A model assessment. Human Reproduction 2004; 19 (7): 1548–1553.
(106) Morris JK, Mutton DE, Alberman E. Revised estimates of the maternal age specific live birth prevalence of Down's syndrome. Journal of medical screening 2002; 9 (1): 2–6.
(107) Nelson S M, Telfer E E, Anderson R A. The ageing ovary and uterus: new biological insights. Human Reproduction Update 2012; 19 (1): 67–83.
(108) Jolly M, Sebire N, Harris J, Robinson S et al. The risks associated with pregnancy in women aged 35 years or older. Hum Reprod 2000; 15: 2433–37.
(109) Joseph KS, Allen AC, Dodds L, Turner LA et al. The perinatal effects of delayed childbearing. ObstetGynecol 2005; 105: 1410–18.
(110) Aliyu MH, Salihu HM, Wilson RE, Alio AP et al. (2008) The risk of intrapartum stillbirth among smokers of advanced maternal age. Arch GynecolObstet 2008; 278: 39-45.
(111) Delbaere I, Verstraelen H, Goetgeluk S, Martens G et al. Pregnancy outcome in primiparae of advanced maternal age. Eur J ObstetGynecolReprodBiol 2007;135: 41–46.

(112) Hoffman MC, Jeffers S, Carter J, Duthely L et al. Pregnancy at or beyond age 40 years is associated with an increased risk of fetal death and other adverse outcomes. Am J ObstetGynecol 2007;196: e11–13.

(113) O'Leary CM, Bower C, Knuiman M, Stanley FJ. Changing risks of stillbirth and neonatal mortality associated with maternal age in Western Australia 1984–2003. PaediatrPerinatEpidemiol 2007;21: 541–549.

(114) Flenady V, Koopmans L, Middleton P, FroenJF et al.Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. Lancet 2011; 377: 1331–1340.

(115) Janssens S, Wallace KL, Chang AM. Prepartum and intrapartum caesarean section rates at Mater Mothers' Hospital Brisbane 1997–2005. Aust N Z J ObstetGynaecol 2008; 48: 564–569.

(116) Jolly M, Sebire N, Harris J, etal. The risks associated with Pregnancy in women aged 35 years or older. Hum Reprod 2000;15: 2433–7.

(117) Jacobsson B, Ladfors L, Milsom I. Advanced maternal age and adverse perinatal outcome. ObstetGynecol 2004;104:727–33.

(118) Cleary-Goldman J, Malone F D,Vidaver J, etal. Impact of maternal age on obstetric outcome. ObstetGynecol 2005;105:983–90.

(119) Joseph KS, Allen AC, Dodds L, etal. The perinatal effects of delayed child bearing. ObstetGynecol 2005;105:1410–18.

(120) . Luke B, Brown MB. Elevated risks of pregnancy complications and adverse outcome within creasing maternal age. Hum Reprod 2007;22:1264–72.

(121) Delbaere I, VerstraelenH ,Goetgeluk S, etal. Pregnancy outcome in Primiparae of advanced maternal age. EurJ ObstetGyneco l ReprodBiol 2007;135:41–6.

(122) HsiehTT,LiouJD,HsuJJ, etal .Advanced maternal age andAdverseperinataloutcomesinan Asian population. Eur J ObstetGynecolReprodBiol 2010;148:21–6.

(123) MatsudaY,KawamichiY, Hayashi K, et al. Impact of maternal age on the prevalence of obstetrical complicationsi n Japan J ObstetGynaecol Res 2011;37:1409–14.

(124) Biro MA, Davey MA, Carolan M, et al. Advanced maternal age and Obstetric morbidity for women giving birth inVictoria, Australia:a population-based study. Aust N Z J ObstetGynaecol 2012;52: 229–34.

(125) Edmonds K (Ed.). Dewhurst's textbook of obstetrics and gynecology. Wiley Blackwell, 2012.

(126) Hoque M, Hoque S. Comparison of obstetrics and perinatal outcome of teenagers and older women: Experience from rural South Africa. Afr J Pm Health Care Fam Med 2010; 2(1):171.

(127) Saxena P, Salhan S, Chattopadhyay B, Kohli MPS, et al.Obstetric and perinatal outcome of teenage and older primigravidas: A retrospectiveanalysis. Health and Population: Perspectives and Issues 2010; 33(1): 16-22.

(128) Gazala Y, Arunan K, Bharti P. Teenage Pregnancy: its impact on maternal and foetal outcome. International Journal of Scientific Study 2014;1(6): 9-13.

(129) Borton C. Gravidity and parity definitions (and their implications in risk assessment). Patient. http://patient.info/doctor/gravidity-and-parity-definitions-and-their-implications-in-risk-assessment. 2014.

(130) World Health Organization. Antenatal Care.www.who.int/gho/urbn_health/services/antenatal_care_text/en/ . Retrieved July 2016.

(131) Chamberlian G (Ed). Obstetric by ten teacher. Arnold. Oxford University press. New York,1995.

(132) Kim, SC, Pope J. Physical Growth in Newborns. Emedicine health, January 10, 2013.

(133) Thato S, Rachukul S, Sopajaree C. Obstetrics and perinatal outcomes of Thai pregnant adolescents: A retrospective study. International Journal of Nursing Studies 2007; 44(7): 1158-1164.

(134) Amini SB, Catalano PM, DierkLJ, Mann LI. Birth to teenagers: Trends and Obstetric Outcomes. Obstetrics & Gynecology 1996; 87(5,1): 668-74.

(135) Population Council. Unexplored Elements of Adolescence in the Developing World. Popul Briefs 2006;12(1).http://www.popcouncil.org/pdfs/popbriefs/pbjan06.pdf.

(136) Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks associated with pregnancy in women aged 35 years or older. Hum Reprod 2000; 15(11): 2433-37.

(137) Ayuba II, Gani, O. Outcome of Teenage Pregnancy in the Niger Delta of Nigeria. Ethiopian journal of health sciences 2012; 22(1):45-50.

(138) Fraser AM, Brockert JE, Ward RH. Association of Young Maternal Age with Adverse Reproductive Outcomes. N Engl J Med 1995; 332:1113-1118.

(139) LaoTT, Ho LF. Obstetric outcome of teenage pregnancies. Hum Reprod 1998; 13 (11): 3228-32.

(140) GadowskySL,Wolfe GK, Jory SA, Gibson J et al. Biochemical folate, B12and iron Status of a group of pregnant adolescents accessed through the public health system in southern Ontario.Journalo Adolescent Health 1995;16, 465-74.

(141) Hoque M, Hoque S. A comparison of obstetrics and perinatal outcomes of teenagers and older women: Experiences from rural South Africa. Afr J Prim Health Care Fam Med 2010; 2(1): 171.

(142) Khwaja SS, Al-Sabai MH, Al-Suleiman AS, El-Zibdeh MY. Obstetric implications of pregnancy in adolescence. Acta Obstet Gynecol Scand 1984; 65:57-61.

(143) Moerman ML. Growth of the birth canal in teenage girls. Am J ObstetGynecol 1982;143:528–532.

(144) Lao TT, Ho LF. The obstetric implications of teenage pregnancy. Hum Reprod 1997;12: 2303–05.

(145) Sagili H, Pramaya N, Parbhu K, Mascarenhas M et al. Are teenage pregnancies at high risk? A comparison study in a developing country. Arch GynecolObstet 2012;285(3):573-77.

(146) Smith GC, Pell JP Teenage pregnancy and risk of adverse perinatal outcomes associated with first and second births: Population based retrospective cohort study. BMJ 2001; 323(7311):476.

(147) Ebeigbe PN, Gharoro EP: Obstetric complications, intervention rates and maternofetal outcome in teenage nullipara in Benin City, Nigeria. Trop Doct2007; 37: 79-83.

(148) Allen LH. Pregnancy and iron deficiency: Unresolved issues. Nutr Rev 1997; 55:91–103.

(149) British Nutrition Foundation. Iron: Nutritional and physiological significance. Chapman and Hall, London, 1995.

(150) Department of Health Guidelines for maternity care in South Africa: A manual for clinics, community health centres and district hospitals. Pretoria, Department of Health, 2002.

(151) Hays PM, Cruikshank DP, Dunn LJ. Plasma volume determination in normal and preeclamptic pregnancies. Am J ObstetGynaecol 1985;151:958–66.

(152) Jolly MC, Sebire N, Harris J, Robinson S, Regan L. Obstetric risks of pregnancy in women less than 18 years old. Br J Obstet Gynaecol 2000; 96 (6): 962–66.

(153) Carolan M, Nelson S: First mothering over 35 years: questioning the association of maternal age and pregnancy risk. Health Care Women Int 2007; 28: 534-55.

(154) Cleary-Goldman J, Malone FD, Vidaver J, Ball RH et al. FASTER Consortium. Impact of maternal age on obstetric outcome. Obstet Gynecol. 2005; 105(5,1): 983-90.

(155) Joseph KS, Allen AC, Dodds L, Turner LA et al.Theperinatal effects of delayed childbearing.Obstetrics and Gynaecology 2005; 105(6): 1410-1418.

(156) Grotegut CA, Chisholm CA, Johnson LNC, Brown HL, et al. Medical and Obstetric Complications among Pregnant Women Aged 45 and Older. PLOS One 2016;11(3): e0151307.

(157) Timofeev J, Reddy UM, Huang CC, DriggersRW et al. Obstetric Complications, Neonatal Morbidity, and Indications for Cesarean Delivery by Maternal Age. ObstetGynecol 2013;122(6): 1184-95.

(158) Dietl A, Farthmann J. Gestational hypertension and advanced maternal age. 2015;386 (10004): p1627–28.

(159) Balasch J, Gratacós E. Delayed childbearing: effects on fertility and the outcome of pregnancy. Fetal DiagnTher 2011; 29(4): 263-73.

(160) Shareif M, Dhaymaa A. Effect of advanced maternal age on pregnancy outcome. Thesis for degree of Diploma in Obstetrics and gynecology. Basrah Medical College. Department of Obstetrics and gynecology, 2008

(161) .Aghamohammad A, Noorityajer M. Maternal age as a risk factor for pregnancy outcome. African Journal of Pharmacy and Pharmacology 2011; 5 (2): pp. 264 – 269.

(162) JahromiBN, Husseini Z. Pregnancy outcome at maternal age 40 and older. Taiwan J ObstetGynecol 2008; 47(3):318-21.

(163) Santos GHN, Martins MG, Sousa MS, BatalhaSJC. Impactodaidadematernasobreosresultadosperinatais e via de parto. Rev Bras GinecolObstet 2009; 31(7):326-34.

(164) AlmhfoothWF, Dahos MB. Advance Maternal Age and Pregnancy Outcome. Karbala J Med 2013; 6(1).

(165) NamavarJB, Husseini Z. Pregnancy outcome at maternal age 40 and older. Taiwan J. Obstet. Gynecol 2008; 47(3): 318- 21.

(166) Paulson RJ, Boostanfar R, Saadat P, Mor E et al. Pregnancy in the sixth decade of life. Obstetric outcome in women of advanced reproductive age. JAMA 2002; 288:2320-23.

(167) Dietl A, Cupisti S, Beckmann MW, Schwab M, Zollner U. Pregnancy and Obstetrical Outcomes in Women Over 40 Years of Age. Geburtshilfe und frauenheilkunde 2015; 75(8): 827-32.

(168) Kanungo J, James A, McMillan D, Lodha A et al. Advanced maternal age and the outcomes of preterm neonates: A social paradox? Obstetrics & Gynecology2011; 118 (4): 872-77.

(169) Gill JV, Boyle EM. Outcomes of Infants Born Near Term. Arch Dis Child 2016; 102 (2): 194-8.

(170) SalihuHM,ShumpertMN,SlayM,KirbyRS,AlexanderGR.Childbearingbeyondmaternalage50andfetaloutcomesintheUnitedStates. Obstet Gynecol 2003;102:1006–1014.

(171) Bell JS, Campbell DM, GrahamWJ, Penney GC, et al. Do obstetric complications explain high caesarean section rates among women over 30? A retrospective analysis. BMJ 2001; 14(322): 894-95.

(172) Kenny LC, Lavender T, McNamee R, O'Neill SM, et al. Advanced maternal age and adverse pregnancy outcome: Evidence from a large contemporary Cohort. http://dx.doi.org/10.1371/journal.pone.0056583. February 2013.

(173) Karlström A, Nystedt A, Hildingsson I. A comparative study of the experience of childbirth between women who preferred and had a caesarean section and women who preferred and had a vaginal birth. Sex ReprodHealthc 2011; 2(3): 93-99.

(174) Ates S, Batmaz G, Sevket O,Molla T, Dane C, Dane B. Pregnancy Outcome of Multiparous Women Aged over 40 Years. International Journal of Reproductive Medicine 2013; Article ID 287519.

(175) Katikireddi SV, Gorman DR, Leyland AH. A comparison of trends in caesarean section rates in former communist (transition) countries and other European countries. The European Journal of Public Health 2013; 23(3): 381-383.

(176) Vaughan DA, Cleary BJ, Murphy DJ. Delivery outcomes for nulliparous women at the extremes of maternal age: a cohort study.BJOG 2014; 121(3):261-8.