



## Overview of adolescent pregnancy over a two-decade at King Abdulaziz University Hospital: A chart review study

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**Abstract:** Adolescent pregnancy can result in preterm delivery, gestational hypertension, anemia, and sexually transmitted diseases, increasing the morbidity and mortality of the mother and their offspring. We aimed to provide an overview of adolescent pregnancy during the period of 2000 to 2019. A chart review study was conducted at King Abdulaziz University Hospital, Saudi Arabia. Women with a gestational age of 24 weeks or more, with aged  $\leq 19$  years, free of chronic medical problems, and who delivered from January 2000 to December 2019 were recruited for the study. Data were collected from maternal and neonatal medical records, analyzed, and interpreted according to qualitative content analysis. A total of 5.56% of the deliveries were in adolescent mothers. Of these, 95.03% were late adolescents (16–19 years old). This study revealed that the prevalence of adolescent pregnancy in Saudi Arabia decreased over the duration of the study, with a shift toward a higher incidence of adolescent pregnancy during the late adolescent stage.

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### 1. Introduction

Adolescence is the period of transition between childhood and adulthood. According to the World Health Organization (WHO), it spans between the ages of 11–19 years. Pregnancy during this period is called teenage or adolescent pregnancy [Shaikh et al., 2016].

The marriage of adolescents aged 10–19 y is a worldwide concern; in addition, the interval between marriage and having the first offspring is decreasing over time [McIntyre, 2006]. Teenagers are subjected to dramatic physical changes, which considerably vary between individuals, that greatly affect their health and behavior, which in turn, are affected by the adolescent's characteristics and environment. A lack of social support is associated with adolescent

pregnancy. Culture and tradition may also be contributing factors to adolescent pregnancies [Al Jahdali, 2017].

Adolescent pregnancy, which is pregnancy at  $\leq 19$  years of age, is a worldwide health problem in both developed and developing countries [Lowlor and Shaw, 2004].

According to the WHO, approximately 16 million girls aged 15–19 years and 1 million girls under 15 years of age give birth every year, most of whom are from low- and middle-income countries [WHO, 2014].

Evidence from the developing world indicates that one-third of women become mothers by 19 years of age [Viegas et al., 1992]. This is one of the major public health problems in South Asia [Raj et al., 2010] and Western Europe

[Seamark, 2001]. The 2014 World Health Statistics indicate that the average global birth rate among 15-19-year-old adolescents is 49 out of 1,000, with the highest rates in sub-Saharan Africa 13 [WHO, 2014].

In India, adolescent pregnancy is a serious health problem [Patra, 2016]. In Nigeria, the ratio of adolescent and adult pregnancies wherein the mother dies during pregnancy or childbirth is 5:1. In addition, infants are likely to have higher infant mortality rates [Amoran, 2012]. In Bahrain, one in five adolescents deliver before 16 years of age, and some teenage mothers are as young as 11 years old. In Mali, 25% of girls get married by 15 years of age, 10% get pregnant by 15 years of age, and nearly 40% become pregnant or become mothers by 17 years of age [Katzive, 2003]. Adolescent pregnancy rates are high in Mexico and Sub-Saharan Africa [Sedgh et al., 2015]. In Saudi Arabia, there are higher rates of adolescent deliveries due to the traditions of early marriage and social expectations of having a child soon after marriage [El-Gilany and Hammad, 2012]. Pregnancy in adolescents causes vast medical problems to both the mother and fetus, and evidence-based studies have revealed that infant mortality in the offsprings of teenage mothers is higher than in those of mothers aged  $\geq 19$  years [WHO, 2004]. A mother under the age of 18 years has an increased risk of losing her first offspring in the first year of life by 60% compared to the offspring of a mother aged  $\geq 19$  years [Al-Kadri et al., 2014].

Adolescent pregnancy is associated with a higher incidence of pain, psychological trauma, preterm delivery [Koleva and Stuart, 2013], low birth weight [Santos and Rosario, 2011], perinatal mortality, and pregnancy and delivery complications, mainly hemorrhage, sepsis, preeclampsia or eclampsia, and obstructed labor than women aged  $\geq 19$  years [WHO, 2010].

Pregnant teenagers are more susceptible to pregnancy complications, such as poor maternal weight gain, premature birth, gestational hypertension, anemia, sexually transmitted diseases, and higher susceptibility to obstructed labor and fistula development [UNFPA, 2013]. According to the WHO, adolescent pregnancy is the primary cause of maternal and child deaths [WHO, 2017].

Based on the negative impact of adolescent pregnancies, worldwide campaigns are required to increase the awareness of the population of its health hazards through proper education, awareness, and information dissemination. In addition, parents play a crucial role in actively

monitoring their children as they begin puberty [Al-Kadri et al., 2014].

Therefore, we conducted this study to assess the rate and outcome of adolescent pregnancy over the last two decades (2000 to 2019) at King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia.

## 2. Methods

A review chart study of 62,690 (100%) pregnant women, of which 3,487 (5.56%) were adolescents, was conducted to assess the rate of adolescent pregnancy from 2000 to 2019 at KAUH.

The analyzed data were divided into two parts:

-The first part included all deliveries conducted in KAUH in 2000-2019, and the percentage of adolescent deliveries per year.

-The second part included the maternal and fetal outcome.

All pregnant women with gestational age of 24 weeks or more, aged  $\leq 19$  years, were free of any chronic medical problems, and who delivered during January 2000 to December 2019 at KAUH, Jeddah, Saudi Arabia, were recruited for the study. Multigravidas' women with multiple pregnancies, smokers, and those aged  $> 19$  years were excluded from the study.

## Statistical Analysis

The collected data were revised, coded, and tabulated using the Statistical Package for Social Science (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, version 21.0. Armonk, NY: IBM Corp.).

Data were presented, and a suitable analysis was performed according to the type of data obtained for each parameter. The mean and standard deviation were used to describe the parametric numerical data, while the median and range were used for non-parametric numerical data. Frequency and percentage were used to describe non-numerical data.

## 3. Results

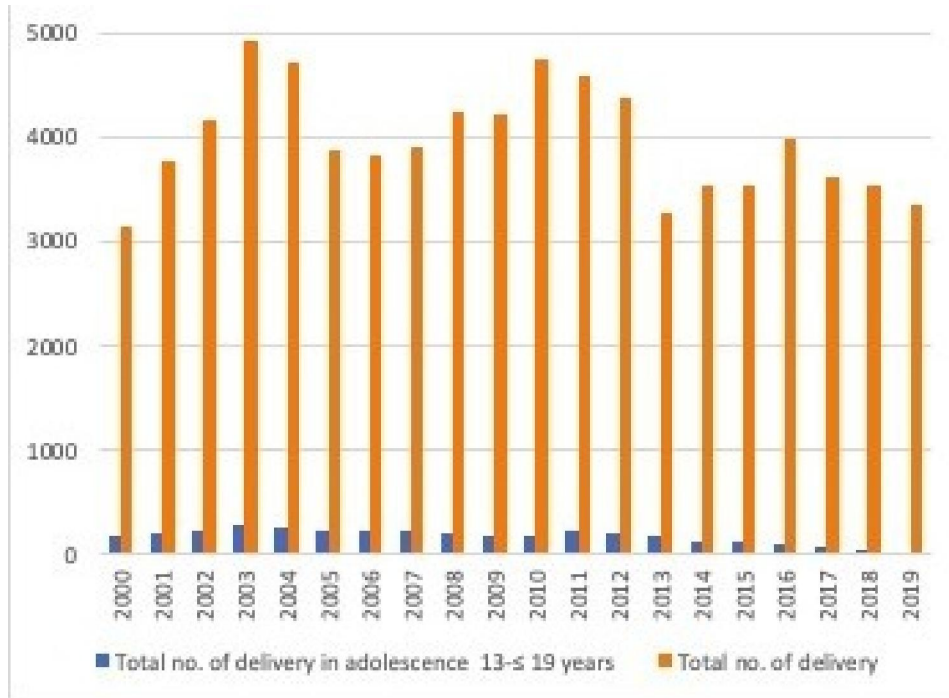
The number of total deliveries per year and the number of adolescent deliveries per year are shown in Figure 1. Of the 62,690 (100%) total deliveries, including 3,487 (5.56%) adolescent deliveries, during the study period of 2000–2019 at KAUH, Jeddah, Saudi Arabia, the percentage of adolescent deliveries decreased from 5.6% in 2000 to 0.4% in 2019 (Figure 1).

**Table 1** Number and prevalence of adolescent deliveries per age per year, indicating that most adolescent deliveries (95.03%) were in the late

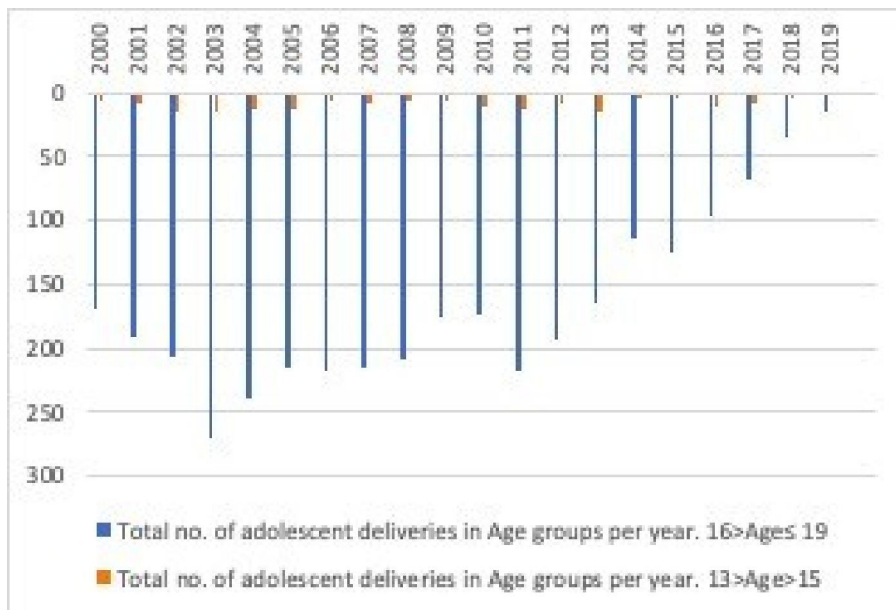
adolescent group, aged 16–19 years, during the period 2000–2019. No deliveries were observed at the ages of 13–14 years from 2014 to 2019.

**Table 2** Total number and percentage of adolescent deliveries in early (13– 15 years) and

late (16–19 years) adolescent age groups per year. There was a significantly higher percentage of deliveries in the 16–19 years age group than in the 13–15 years age group from 2013 to 2019 (Figure 2).



**Figure 1:** Total number of deliveries in adolescent age (13 to ≤19 years) per year from 2000 to 2019. Number = 3487



**Figure 2:** Total number of deliveries in the adolescent age groups (13–15 and 16 to ≤19 years) per year from 2000 to 2019. Number = 3487

**Table 1. Number and prevalence of adolescent deliveries per age per**

	13	14	15	16	17	18	≤19
2000 (N=176)		2(1.1)	4(2.2)	15(8.5)	23(13)	56(31.8)	76(43.1)
2001 (N=200)	1(0.05)	1(0.05)	6(3.4)	18(10.2)	25(14.2)	55(31.2)	94(53.4)
2002 (N=223)	1(.04)	5(2.2)	10(4.4)	16(7.1)	43(19.2)	48(21.5)	100(44.8)
2003 (N=286)		4(1.3)	11(3.8)	15(5.2)	54(18.8)	85(29.7)	117(40.9)
2004 (N=252)		5(1.9)	7(2.7)	21(8.3)	41(16.2)	63(25)	115(45.6)
2005 (N=228)	2(0.08)	5(2.1)	4(1.7)	18(7.8)	29(12.7)	70(30.7)	99(43.4)
2006 (N=224)		4(1.7)	2(0.08)	15(6.1)	45(20)	65(29)	93(41.5)
2007 (N=224)		2(0.08)	7(3.1)	20(8.9)	34(15.1)	70(31.2)	91(40)
2008 (N=215)			7(3.2)	17(7.9)	26(12.2)	73(33.9)	92(42.9)
2009 (N=182)			7(3.8)	15(8.2)	31 (17)	45(24.7)	84(46.1)
2010 (N=184)	3(1.6)	2(1)	5	13(7)	25(13.5)	51(27.7)	85(46.1)
2011 (N=229)		2(0.08)	10(4.3)	17(7.4)	33(14.4)	68(29.6)	99(43.2)
2012 (N=201)		2(.09)	6(2.9)	14(6.9)	37(18.4)	51(25.3)	91(45.2)
2013 (N=180)	2(1.1)	5(2.7)	8(4.4)	17(9.4)	27(15)	45(25)	76(42)
2014 (N=118)			3(2.5)	10(8.4)	18(15.2)	35(29.6)	52(44)
2015 (N=127)			4(3.1)	6(4.7)	17(13.2)	37(29.1)	63(49)
2016 (N=108)			3(2.7)	8(7.4)	14(12.9)	31(28.7)	52(48.1)
2017 (N=75)			2(2.6)	6(8)	16(21.3)	19(25.3)	32(42.6)
2018 (N=40)				1(2.5)	4(10)	15(37.5)	20(50)
2019 (N=15)					2(13.3)	3(20)	10 (66.7)

Year (N=3487)

**Table 2. Total number and percentage of adolescent deliveries per age group per year from 2000 to 2019. Number = 3487**

Year	Total no. of adolescent deliveries per year	Total no. and percentage of adolescent deliveries per age groupper year		P value
		13–15	16 to ≤19	
2000	176	6(3.4)	170(96.6)	Reference category
2001	200	8 (4)	192(96)	P=0.71
2002	223	16(7.1)	207(92.9)	P=.087
2003	286	15(5.2)	271(94.8)	P=0.32
2004	252	12(4.7)	240(95.3)	P=0.44
2005	228	12(5.2)	216(94.8)	P=0.33
2006	224	6(2.6)	218(97.4)	P=0.71
2007	224	9(4)	215(96)	P=0.70
2008	215	7(3.2)	208(97.8)	P=0.98
2009	182	7(3.8)	175(97.2)	P=0.82
2010	184	10(5.4)	174(94.6)	P=0.31
2011	229	12(5.2)	217(94.8)	P=0.53
2012	201	8(3.9)	193(96.1)	P=0.72
2013	180	15(8.3)	165(91.7)	P=0.041*
2014	118	3(2.5)	115(97.5)	P=0.49
2015	127	3(3.1)	124(96.9)	P=0.93
2016	108	11(10.1)	97(89.9)	P=0.015*
2017	75	8(10.6)	67(89.4)	P=0.023*
2018	40	5(12.5)	35(87.5)	P=0.029*
2019	15	00	15(100)	P<0.001*
<b>TOTAL</b>	3487	173 (4.97)	3314 (95.03)	

**Table 3** shows the clinical characteristics of pregnancy at adolescence from 2000 to 2019. Most of the studied cases were in the age group of 16–19 years. Half of them were of Saudi adolescents. Approximately 63.98% were primigravida and 89.33% had full-term pregnancies.

**Table 4** shows the impact of adolescent pregnancy on the fetus from 2000 to 2019. The placenta was normal in 99.37% of the studied cases. Blood loss during delivery was 300–600 mL in 15.60% and >600 mL in 4.47% of the patients. Birth weight ranged from 2.5 to 3.5 kg in 68.89% of the studied cases. The prevalence of congenital anomalies was 1.38%, and the Apgar score was normal in 98.27% of the studied cases.

**Table 3. Clinical characters of adolescent pregnancy per age group from 2000 to 2019. Number = 3487**

Data	Number (percentage)
<b>Age</b>	
13–15	173 (4.96%)
16 to ≤19	3314 (95.04%)
<b>Booking</b>	
Booking	2549 (73.10%)
Unbooking	938 (26.90%)
<b>Nationality</b>	
Saudi	1766(50.65%)
Non-Saudi	1721 (49.35%)
<b>Parity</b>	
1	2231 (63.98%)
2–4	1104 (31.66%)
5	152 (4.36%)
<b>Abortion</b>	
No abortion	2965 (85.03%)
One	322 (9.23%)
More than one	200 (5.74%)
<b>Gestational Age</b>	
Full-term	3115 (89.33%)
Preterm	372 (10.67%)

**Table 4. Impact of adolescent pregnancy on fetus from 2000 to 2019. Number = 3487**

Variables	N (%)
<b>Placenta</b>	
Normal	3465(99.37%)
Incomplete	10 (0.29%)
Manual Removal	12 (0.34%)
<b>Loss of blood</b>	
< 300 cc	2787 (79.93%)
300-600	544 (15.60%)
>600 cc	156 (4.47%)
<b>Birth weight</b>	
<2.5	685 (19.64%)
2.5–3.5	2402 (68.89%)
>3.5	400 (11.47%)
<b>Congenital malformation</b>	
Free	3439 (98.62%)
Skeletal	6 (0.17%)
Central Nervous System	5 (0.14%)
Chromosomal	2 (0.06%)
Gastrointestinal	4 (0.11%)
Renal and cardiac	10 (0.30%)



Others	21 (.6%)
<b>Apgar score</b>	
Normal ( $\geq 5$ out of 5)	3427 (98.27%)
Abnormal ( $< 5$ out of 5)	15 (0.43%)
Dead	45 (1.30%)
<b>Admission</b>	
Department	3322 (95.27%)
Neonatal Intensive Care Unit for Distress, preterm and anomalies	120 (3.44%)
Dead	45 (1.29%)

Data are expressed as number and percentage

#### 4. Discussion

Maternal age, particularly adolescent age, greatly influences pregnancy and fetomaternal outcomes, as evidenced by several studies, and is affected by socioeconomic, educational, and cultural factors, which vary significantly from one country to another [McCall et al., 2015].

Adolescent pregnancy is common in low- and middle-income communities due to the low socioeconomic standards, lower educational attainment levels, lack of health services, and poor maternal nutrition, which consequently lead to a higher rate of maternal, neonatal, and infant comorbidities and mortalities [Shahabuddin et al., 2015].

There is a paucity of studies on the effect of maternal age on fetomaternal outcomes in Saudi Arabia and on the prevalence of adolescent pregnancy.

Pregnancy among adolescents in Saudi Arabia is highly prevalent and correlated with preterm delivery and low birth weight, which is directly related to the socioeconomic profile of adolescent pregnancy in Saudi Arabia and the free access and use of antenatal and prenatal care [Balaha et al., 2009; El-Gilany and Hammad, 2012]. This is attributed to the fact that pregnant Saudi women are eligible for free antenatal care in primary healthcare settings that consider referral to more specialized hospitals for ultrasound or treatment of any suspected comorbidities. All deliveries take place in these specialized hospitals by professional healthcare consultants and specialists, with a maternal mortality ratio of less than 13 out of 100,000 [Habib et al., 2011].

Based on the health hazards of adolescent pregnancy, we carried out this cross-sectional review chart study to assess the prevalence of adolescent pregnancy over two decades (January 2000 to December 2019). We recorded 62,690 pregnant women, of whom 3,487 (5.56%) were adolescents. The rate of adolescent deliveries during the study period declined from 5.6% in

2000 to 0.4% in 2019. This is in line with the results of previous studies in Saudi Arabia, where a recent study by Fayed et al. [2017] that assessed the demographic profile and pregnancy outcomes of adolescents in Jeddah, Saudi Arabia included 14,514 females and reported that the rate of adolescent pregnancy was 20 per 1000. This was lower than that reported in 1999 in Jeddah, Saudi Arabia, which was 60 per 1000 [Mesleh et al., 2001]. This was also supported by data from the World Bank on adolescent pregnancy in Saudi Arabia, where the rate declined from 124 per 1000 in 1960 to 9 per 1000 in 2014 [World Bank, 2017].

The decrease in adolescent pregnancy in Saudi Arabia may be attributed to the improved level of education, improved socioeconomic standards, and the employment status of Saudi women in their community [Fayed et al. 2017]. They reported that adolescents' literacy level were only 1.2%. These findings were supported by the WHO on Saudi women's education and employment status, where Saudi women's employment rates increased markedly by 85% from 2009 to 2013, and the literacy rate increased from 79.7% in 2004 to 85.0% in 2010 [WHO, 2012; SMLDS, 2013]. Similar results were recorded in a study by Al Jahdali [2017], wherein the adolescent delivery rate decreased over 17 years from 5.01% in 2000 to 2.7% in 2016.

The rate of adolescent deliveries in Saudi Arabia is much lower than that worldwide and many other countries. The WHO reports that approximately 16 million adolescent girls aged 15–19 years, who represent an estimated 11% of all deliveries worldwide, become pregnant and deliver annually [Darroch et al., 2016], and 95% of adolescent deliveries occur in developing countries [UNFPA, 2015]. The adolescent fertility rate worldwide was approximately 55.3/1000 from 2000 to 2005, which means that, on average, approximately 5.5% of adolescent deliveries take place per year [UN DESA, 2015].

Higher rates of pregnancy and deliveries among adolescents were reported in Saudi Arabia in early years; the rate of adolescent pregnancy in Jeddah in particular in 2001 was 6% [Mesleh et al., 2001]. In addition, in areas other than Saudi Arabia, higher rates were recorded. In India, the percentage of adolescent pregnancies was 10.4% [Talawar and Venkatesh, 2013], in Egypt, 7.5% [Rasheed et al., 2011], in the US, 5.7%, and in Switzerland, 0.8% [Sedgh et al., 2015].

In the Philippines, according to the latest National Statistics registry, in 2008, a total of 1,784,316 births were registered; 10.4% (186,527 births) were adolescent deliveries, with an increase in adolescent pregnancy rates of 7.6%, from 173,282 in 2007. Assuming the same level of underreporting for teenage births as for total births, this suggests that fertility has a faster pace in the youngest reproductive age group [IVIDAD, 2014].

In a large population-based registry study conducted in seven regions in six low- to middle-income countries (Kenya, Zambia, India, Pakistan, Guatemala, and Argentina), the prevalence of adolescent pregnancy greatly varied among different regions; in India and Pakistan, the prevalence of adolescent pregnancy was <10%; in sub-Saharan Africa and Latin America, it varied from 16 to 27%. However, in South Asia, there were decreasing rates of adolescent pregnancies [Althabe et al., 2015].

The global adolescent pregnancy rate decreased from 6.5% in 1990 to 4.7% in 2015 [UN DESA, 2015]. However, the adolescent population will continue to rise dramatically by 2030, with the greatest increase in West, Central, East, and Southern Africa [UNFPA 2015].

In addition, different adolescent pregnancy and delivery rates have been reported worldwide, ranging from a high rate of 11.5% in West Africa, 6.4% in Latin America, and 4.5% in the Caribbean in Southeast Asia to a low percentage of 0.7% in East Asia [Tanveer and Fatima 2016], with a tremendous increase in the rural populations [EWEC, 2015 42].

In Pakistan, Shaikh et al. [2016] conducted a retrospective study using the Liaquat University Hospital Hyderabad registry in 2015 to include all adolescent pregnant women aged between 13 and 19 years, and reported the rate of teenage pregnancy to be 4.9% [Shaikh et al., 2016].

Generally, the recorded rate in evidence-based studies of adolescent pregnancies or deliveries ranged between 1.6% and 10.4% [Talawar and Venkatesh, 2013].

Another finding in this study was that the majority of adolescent deliveries, with a mean of 91.2%, were from the late adolescent group aged between 16–19 years. This is consistent with previous studies; in a large population-based registry study, a total of 269,273 women were recruited from January 2010 to December 2013, and it was found that 11.9% were in the late adolescent age group of 15–19 years, while 0.14% were <15 years old. Adolescent pregnancy in the late adolescent age group of 15–19 years ranged from 2% in Pakistan to 26% in Argentina, yet pregnancies in adolescents <15 years old were recorded only in Latin America and sub-Saharan Africa [Althabe et al., 2015].

Shaikh et al. [2016] also reported similar results in line with ours, wherein the average age of adolescents recruited into the study was 17.35 years, which is comparable to other studies in Pakistan, such as the studies by Tanveer et al. in the teaching hospital of Lahore, Pakistan [Tanveer and Fatima 2016], Yasmin et al. [2014], and Shaikh et al. [2012].

Based on this study, there is a general decrease worldwide and in Saudi Arabia in the rate and prevalence of adolescent deliveries reflected in the major decline over the years, which is attributed to the increasing level of awareness of the fetomaternal hazards of adolescent pregnancy, especially during the early teenage period, with a shift toward a higher incidence of adolescent pregnancy in the late period of adolescence.

### Limitations

Our study had a few limitations. First, we did not assess the effect of socio-demographic characteristics, risk factors, or environmental factors that may have increased the incidence of adolescent pregnancy. Second, there was a lack of assessment of the fetomaternal health consequences of adolescent pregnancy. Third, the generalizability of our results is limited due to the cross-sectional nature of our study, as cross-sectional studies are often subjected to the dropout of cases. In addition, only one center was included in our study, which also limits the generalizability of our results. However, one of the main strengths of this study is that, to the best of our knowledge, this is the first study to assess the prevalence of adolescent deliveries over a long period of time, which provides a chance to carry out a series of studies to assess the risk factors and fetomaternal health hazards of pregnancy during this critical and fragile stage of life.

**Conclusion:**

These results revealed that the percentage of adolescent pregnancy decreased throughout the study duration in Saudi Arabia, with a shift toward a higher incidence of adolescent pregnancy in the late period of adolescence.

However, further in-depth studies are required to assess the maternal and fetal adverse outcomes of adolescent pregnancy to postulate strategies to increase awareness of the importance of early antenatal and perinatal care and fetomaternal hazards resulting from early pregnancy.

**Abbreviations:**

KAUH; King Abdulaziz University Hospital  
KSA; Kingdom of Saudi Arabia  
WHO; World Health Organization

**Declarations:****Ethics approval and consent to participate:**

The study was approved by the Ethical Research Committee of King Abdulaziz University Hospital, Jeddah, Saudi Arabia. Informed verbal consent was obtained from the participants to share their data in this study and approved by the Ethical Research Committee.

**Consent for publication:**

Not applicable

**Availability of data and materials:**

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

**Competing interests:**

The author reports no conflicts of interest.

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**Authors' contributions:**

Dr. Nawal Alsinani designed and conceived the study, acquired and interpreted the data, wrote, critically reviewed, and revised the manuscript, and approved the final version for publication.

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**Declaration of interest:**

The author reports no conflict of interest. The author alone is responsible for the content and writing of the paper.

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The study was approved by the Ethical Research Committee of King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

**References**

1. Al Jahdali E. Prevalence and Outcome of Adolescent Pregnancy Over 17 years At King Abdul-Aziz University Hospital Jeddah Saudi Arabia. *LifeSci J* 2017;14(8):81-85.
2. Al-Kadri HM, Madkhali A, Al-Kadi MT, Bakhsh H, Alruwaili NN, Tamin H. Tertiary care availability and adolescent pregnancy characteristics in Saudi Arabia. *Int J Womens Health*. 2014;6:359-366.
3. Althabe F, Moore JL, Gibbons L, Berrueta M, SS, Chomba E, Derman RJ, Patel A, Saleem S, Pasha O, Esamai F, Garces A, Hambidge KM, Krebs NF, Hibberd PL,
4. Amoran E. A comparative analysis of predictors of teenage pregnancy and its prevention in a rural town in Western Nigeria. *Int J Equity Health* 2012; 1(37). (<https://doi.org/10.1186/1475-9276-11-37>).
5. Balaha MH, Amr MA, El-Gilany AA, Al Sheikh FM. Obstetric and psychiatric outcomes in a sample of Saudi teen-aged mothers. *TAF Prev Med Bull* 2009; 8(4): 285-290.
6. Darroch J, Woog V, Bankole A, Ashford LS. Adding it up: Costs and benefits of meeting the contraceptive needs of adolescents. New York: Guttmacher Institute; 2016.
7. El-Gilany AH, Hammad S. Obstetric outcomes of teenagers and older mothers: experience from Saudi Arabia. *Int J Collab Res Internal Med Public Health* 2012;4(6):901-904.
8. Every Woman Every Child (EWEC). The Global Strategy for Women's, Children's and Adolescents Health (2016-2030). Geneva: Every Woman Every Child; 2015.



9. Fayed AA, Wahabi H, Mamdouh H, Kotb R, Esmaeil S. Demographic profile and pregnancy outcomes of adolescents and older mothers in Saudi Arabia: analysis from Jedhha Mother (RAHMA) and Baby cohort study. *BMJ Open* 2017; 11; 7(9):e016501. doi: 10.1136/bmjopen-2017-016501
10. Goldenberg RL, Koso-Thomas M, Carlo WA, Cafferata ML, Buekens P, EM McClure, Adverse maternal and perinatal outcomes in adolescent pregnancies: The Global Network's Maternal Newborn Health Registry study. *Reprod Health* 2015;12 (Suppl 2):S8.
11. Habib F, Hanafi MI, El-Sagheer A. Antenatal care in primary health care centres in Medina, Saudi Arabia, 2009: A cross-sectional study. *East Mediterr Health J*. 2011; 17:196-202.
12. IVIDAD, Josefina. Teenage Pregnancy in the Philippines: Trends, Correlates and Data Sources. *Journal of the ASEAN Federation of Endocrine Societies*, [S.l.], v. 28, n. 1, p. 30, may 2014. ISSN 2308-118X. Available at: <<http://asean-endocrinejournal.org/index.php/JAFES/article/view/49/477>>. Date accessed: 07 june 2019.
13. Katzive L. Addressing the Human Rights of Married Adolescents, presented at WHO/UNFPA/Population Council Technical Consultation on Married Adolescents. Geneva: WHO; 2003.
14. Koleva H, Stuart S. Risk factors for depressive symptoms in adolescent pregnancy in a late-teen subsample. *Arch Womens Ment Health* 2014;17(2):155-8. doi: 10.1007/s00737-013-0393-4.
15. Lowlor DA, Shaw M. Teenage pregnancy rates: high compared with where and when? *J R Soc Med* 2004; 97:121-123.
16. McCall SJ, Bhattacharya S, Okpo E, Macfarlane G. Evaluating the social determinants of teenage pregnancy: a temporal analysis using a UK obstetric database from 1950 to 2010. *J Epidemiol Community Health* 2015;69:49-54.
17. McIntyre P. Married Adolescents: No Place of Safety. Oxford, UK: WHO; 2006.
18. Mesleh RA, Al-Aql AS, Kurdi AM. Teenage pregnancy. *Saudi Med J* 2001; 22:864-867.
19. Patra S. Motherhood in childhood: addressing reproductive health hazards among adolescent married women in India. *Patra ReprodHealth* 2016;12(52).
20. Raj A, Rabi B, Amudha P, van Teijlingen E, C Glyn, Factors associated with teenage pregnancy in South Asia: a systematic review. *HealthSci J* 2010; 4(1):3-13.
21. Rasheed S, Abdelmonem A, Amin M. Adolescent pregnancy in Upper Egypt. *Int J Gynaecol Obstet*. 2011;112(1):21-4.A
22. Santos MI, Rosario F. A score for assessing the risk of first-time adolescent pregnancy. *Fam Prac* 2011;28(5):482-488.
23. Saudi Ministry of Labor. Data & Statistics (SMLDS). The annual statistical book 2013. 2013. [www.moh.gov.sa/en/Ministry/Statistics/book/](http://www.moh.gov.sa/en/Ministry/Statistics/book/).
24. Seamark C. Design or accident? The natural history of teenage pregnancy. *Royal Society of Medicine (Great Britain)*. *J Royal Soc Med* 2001; 94(6):282-285.
25. Sedgh G, Finer L, Bankole A, Eilers M, Singh S. Adolescent Pregnancy, Birth, and Abortion Rates Across Countries: Levels and Recent Trends. *J Adolesc Health* 2015; 56(2): 223-230.
26. Shahabuddin AS, Delvaux T, Abouchadi S, Sarker M, De Brouwere V, Utilization of maternal health services among adolescent women in Bangladesh: A scoping review of the literature. *Trop Med Int Health* 2015;20:822-829.
27. Shaikh F, Abbas S, Sultana F, Yousfani S, Hasan T. Adverse Outcome of a Teenage Pregnancy. *J Liaquat Uni Med Health Sci* 2016; 15(04):179-182.
28. Shaikh S, Shaikh AH, Shaikh SAH, B Isran, Frequency of obstructed labor in teenage pregnancy. *NJOG* 2012;7(3):37-40.48
29. Talawar S and Venkatesh G. Outcome of Teenage Pregnancy. *J Dent Med Sci* 2013;6(6):81-83.
30. Tanveer Q, Fatima A. Adolescent pregnancy: A comparative study from the teaching hospital of Lahore, Pakistan. *Professional Med J* 2016;23 (6):727-730.
31. UN DESA, Population Division. World Population Prospects: The 2017 Revision, DVD Edition. New York: UN DESA; 2017. UNDESA, Population Division. World Population Prospects, the 2015 Revision (DVD edition). New York: UNDESA, Population Division, 2015.
32. UN DESA, Statistics Division. SDG Indicators: Global Database. New York: UN DESA: 2017.
33. UNFPA. Motherhood in childhood: Facing the challenge of adolescent pregnancy: The State of World Population 2013. United Nations Population Fund, New York. 2013:163-196.

34. UNFPA. Girlhood, not motherhood: Preventing adolescent pregnancy. New York: UNFPA; 2015.
35. Viegas OA, Wiknsosastro G, Sahagun GH, Chaturachinda K, SS Ratnam, Safe childbirth needs more than medical services. World Health Forum 1992; 13:59-65.
36. World Bank TW. Adolescent fertility rate (births per 1,000 women ages 15-19). 2017. <http://data.worldbank.org/indicator/SP.ADO.TF.RT>.
37. World Health organization (WHO) Adolescent pregnancy: Issues in Adolescent Health and Development. Geneva: WHO; 2004. 92 4 159145 5.
38. World Health Organization (WHO) Maternal Mortality Fact Sheet. Nov, 2010. Available from: <http://www.who.int/mediacentre/factsheets/fs348/en/>.
39. WHO. Country cooperation strategy for WHO and Saudi Arabia 2012-2016.2012. [http://www.who.int/countryfocus/cooperation\\_strategy/ccs\\_sau\\_en.pdf](http://www.who.int/countryfocus/cooperation_strategy/ccs_sau_en.pdf).
40. World Health organization (WHO), Adolescent pregnancy fact sheet. Sept 2014. WHO. Available from: <http://www.who.int/mediacentre/factsheets/fs364/en/>.
41. World Health Organization (WHO). 2017. Retrieved from <http://www.who.int/mediacentre/factsheets/fs364/en/>;  
[http://www.who.int/maternal\\_child\\_adolescent/topics/adolescence/development/en/](http://www.who.int/maternal_child_adolescent/topics/adolescence/development/en/).
42. Yasmin G, Kumar A, B Parihar, Teenage pregnancy-Its impact on maternal and fetal outcome. Int J Scientific Study 2014;1(6):9-13.

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