

# THE OUTCOMES OF PREGNANCY AND CHILDBIRTH IN ADOLESCENTS IN SLOVENIA

## IZIDI NOSEČNOSTI IN PORODA PRI MLADOSTNICAH V SLOVENIJI

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### ABSTRACT

**Introduction.** The objective of the study was to determine the course and outcomes of pregnancy and childbirth in adolescents compared to women aged 20-24 years in Slovenia.

### Keywords:

teenagers, delivery, birth, labour, complications, newborn, birth weight, gestational weight gain

**Methods.** In the retrospective study, the course of pregnancy and labour and the perinatal outcome of newborns in primiparous adolescents aged  $\leq 19$  years (study group) have been compared to the control group of primiparous women aged 20-24 years. The study group was further divided into a study subgroup of adolescents aged  $\leq 17$  years. Data were retrieved from the National Perinatal Information System in Slovenia for the period 2008-2012. Altogether, 13,663 women and their newborns were included.

**Results.** Adolescent pregnancy was associated with increased rates of unknown estimated date of delivery, preterm labour, low birth weight newborns, small for gestational age newborns and low gestational weight gain. Spontaneous labour was more common in adolescents, while emergency and elective Caesarean sections were less common than in women aged 20-24 years. In addition, pregnancy in adolescents aged  $\leq 17$  years was associated with increased rate of maternal anaemia and labour without complications. Higher rates of smoking, lower rates of parenting school attendance, lower rates of pregnancy check-ups and screening tests in pregnancy such as nuchal translucency in adolescents were found.

**Conclusions.** The results of the study show that adolescent pregnancy is related to higher health risks for pregnant adolescents and their newborns. In addition, adolescents are subject to poorer prenatal care comparing to older women.

### IZVLEČEK

### Ključne besede:

adolescentke, najstnice, porod, rojstvo, zapleti, novorojenčki, porodna teža, pridobitev telesne teže

**Uvod.** Namen dela je bil na nacionalni ravni analizirati podatke o poteku nosečnosti in poroda ter podatke o izidu za novorojenčka slovenskih mladostnic. Želeli smo ugotoviti pojavnost zapletov v nosečnosti, med porodom in pri novorojenčku ter značilnosti predporodnega varstva med slovenskimi privesnicami, starimi do 19 let, v primerjavi s privesnicami, starimi med 20 in 24 let.

**Metode.** V retrospektivni raziskavi smo ugotavljali pojavnost zapletov v nosečnosti, med porodom ter izid za novorojenčka in značilnosti predporodnega varstva pri mladostnicah privesnicah, starih do 19 let (študijska skupina), in mlajših od 17 let (študijska podskupina), ter ugotovitve primerjali s kontrolno skupino privesnic, starih med 20 in 24 let. Podatke smo pridobili iz Nacionalnega perinatalnega informacijskega sistema Slovenije (NPIS) za obdobje od leta 2008 do leta 2012. Skupno je bilo v raziskavo vključenih 13.663 privesnic in njihovih novorojenčkov.

**Rezultati.** Nosečnost pri mladostnicah je povezana s povečanim tveganjem za nejasen predvideni datum poroda, prezgodnji porod, nizko porodno težo novorojenčka, novorojenčka, majhnega za gestacijsko starost in nizko pridobitvijo telesne teže med nosečnostjo. Spontan porod je pogostejši pri mladostnicah, medtem ko sta nujni in elektivni carski rez pri tej skupini manj pogosta kot pri ženskah, starih med 20 in 24 let. Nosečnost pri mladostnicah, mlajših od 17 let, je povezana s pogostejšo anemijo matere ter porodom brez zapletov. Mladostnice med nosečnostjo pogosteje kadijo, imajo med nosečnostjo manj pregledov in prenatalne diagnostike, kot je na primer nuhalna svetlina, redkeje tudi obiskujejo šolo za starše.

**Zaključki.** Rezultati raziskave kažejo, da je nosečnost pri mladostnicah povezana z višjim tveganjem za zdravje nosečnice in novorojenčka. Mladostnice imajo tudi slabše predporodno varstvo kot starejše ženske.

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## 1 INTRODUCTION

Adolescence is a period of human growth and development between childhood and adulthood, from ages 10 to 19 years. Many adolescents face pressures to initiate sexual relationships at earlier age, putting themselves at high risk for consequences from sexually transmitted infections to unintended pregnancies (1). Early childbearing increases the risks for both mothers and their newborns, and can also have negative social and economic effects on girls, their families and communities (2). Therefore, the adolescent pregnancy is a public health problem.

The research on sexual behaviour of secondary-school students in Slovenia in 1996, showed that median age of first sexual intercourse was 18.5 years (3) and dropped to 17.0 years in 2004 (4), and 17.6 years in 2012 (5). In 2012, contraceptive methods used at last sexual intercourse by 3rd grade secondary-school students were condom (54.1%), the pill (27.1%), double method (4.2%), withdrawal (4.0%), other methods (3.5%) and no method (7.1%) (5).

In Slovenia, abortion rates in women of reproductive age (aged 15-49 years) have decreased from 25.9 in 1992, to 8.8 in 2012; in women aged 15-19 years, from 12.7 in 1992, to 5.8 in 2012; in women aged 20-24 years, from 33.5 in 1992, to 11.1 in 2012. In the same period, fertility rates in women aged 15-49 years have increased from 39.1 in 1992, to 46.2 in 2012; however, in women aged 15-19 years, fertility rates decreased from 13.9 in 1992, to 4.6 in 2012, and in women aged 20-24 years, from 98.2 in 1992, to 43.7 in 2012 (6, 7). Slovenia had one of the lowest ratios of all live births to mothers aged below 20 years, 1.01 % in 2012 (8).

The studies showed that adolescents' pregnancy and childbirth were related to increased health risk for adolescents and newborns. Girls who got pregnant at the age of 14 years or younger, and, to a lesser extent, at 15-17 years and 18-19 years, were at higher risk of complications during pregnancy (9). They were more likely to experience obstructed labour, fistula, premature birth, and gave birth to low birth weight newborns than older women (10). Moreover, medical risks of adolescent pregnancy could include higher rates of anaemia, pregnancy-induced hypertension, cephalopelvic disproportion, problems with progression of labour, and higher perinatal morbidity (11-14). On the other hand, some studies showed that adolescent mothers had lower risks of third trimester bleeding, gestational diabetes (15) and preeclampsia (16).

Aiming at getting new insights in characteristics of adolescent pregnancy in Slovenia, the objective of our study was to determine the course and outcomes of pregnancy and childbirth in primiparous adolescents compared to primiparous women aged 20-24 years.

## 2 MATERIAL AND METHODS

The study was done on the total population of observed population groups of primiparous women aged up to 24 years, and their newborns in Slovenia for the period 2008-2012. In the retrospective study, the incidence of complications during pregnancy and labour and the perinatal outcome in primiparous adolescents aged up to 19 years (study group) was compared to the control group of primiparous women aged 20-24 years.

In the study, 13,663 primiparous women aged up to 24 years who gave birth during 2008-2012 in Slovenia, and their newborns were included: 1,413 adolescents aged up to 19 years and their 1,423 newborns, and 12,112 women aged 20-24 years and their 12,240 newborns. The study group of primiparous adolescents ( $\leq 19$  years) was further divided into a subgroup of adolescents aged up to 17 years ( $\leq 17$  years, 318 women, 318 newborns). Data were retrieved from the National Perinatal Information System. In the study, the variables for the course of pregnancy, the course of labour, the status of the newborn and prenatal care were used. The majority of variables were observed outcomes, except for participants' age and gestational age at childbirth. Participants' age was an explanatory factor. In multivariate analyses, gestational age was the confounding factor. All dichotomous variables were coded accordingly (e.g. hypertension: 0=no, 1=yes).

Variables on body weight gain during pregnancy (i.e. gestational weight gain) in relation to body mass index (BMI) before pregnancy were used according to the Institute of Medicine guidelines (US) (17). The data were analysed by SPSS programme. Descriptive analysis, analysis of variance (ANOVA),  $\chi^2$  test, correlation and multivariate analyses (multiple linear and multiple logistic regression) were applied where appropriate. Statistical significance was set at  $p < 0.05$ .

## 3 RESULTS

### 3. 1 The Course of Pregnancy

Gestational diabetes and bleeding during pregnancy were less common in the study group of adolescents aged  $\leq 19$  years, while anaemia was more common only in the younger subgroup of adolescents aged  $\leq 17$  years. In addition, unknown estimated date of delivery, threatened preterm labour and preterm labour were more common in adolescents. It was more common for adolescents to have a low and appropriate gestational weight gain compared to women in the control group. No statistically significant differences regarding hypertension, intrauterine growth restriction (IUGR) and foetal anomalies were found (Table 1).

**Table 1.** Results of univariate analysis of the course of pregnancy group of observed outcomes between the study group (age ≤19 years) or the study subgroup (age ≤17 years) and the control group (age 20-24 years) of primiparous women, Slovenia, 2008-2012.

The course of pregnancy	Control group	Study group		Study subgroup	
	20-24 years (N=12,112)	≤19 years (N=1,413)		≤17 years (N=318)	
	n (%)	n (%)	P*	n (%)	P*
Hypertension	598 (4.9)	68 (4.8)	0.837	15 (4.7)	0.858
Anaemia	273 (2.3)	43 (3.0)	0.063	14 (4.4)	0.012
Gestational diabetes	265 (2.2)	10 (0.7)	<0.001	1 (0.3)	0.023
Unknown estimated date of delivery	55 (0.5)	27 (1.9)	<0.001	18 (5.7)	<0.001
Bleeding during pregnancy	616 (5.1)	41 (2.9)	<0.001	8 (2.5)	0.038
Intrauterine growth restriction (IUGR)	291 (2.4)	43 (3.0)	0.142	12 (3.8)	0.118
Foetal anomalies	33 (0.3)	4 (0.3)	0.942	2 (0.6)	0.236
Threatened preterm labour	473 (3.9)	82 (5.8)	0.001	21 (6.6)	0.015
Duration of pregnancy					
Birth at ≤31 weeks	124 (1.0)	28 (2.0)	0.001	7 (2.2)	0.017
Birth at 32-36 weeks	649 (5.4)	94 (6.7)		25 (7.9)	
Birth at ≥37 weeks	11338 (93.6)	1290 (91.4)		286 (89.9)	
Gestational weight gain in relation to BMI before pregnancy					
Appropriate gestational weight gain	3135 (26.0)	341 (24.2)	<0.001	81 (25.6)	<0.001
Low gestational weight gain	1986 (16.4)	357 (25.3)		104 (32.8)	
High gestational weight gain	6953 (57.6)	712 (50.5)		132 (41.6)	

Legend: \* comparison to the control group -  $\chi^2$  test

### 3.2 The Course of Labour

The onset of labour was more commonly spontaneous in adolescents; it was less common for adolescents to need either an administration of PGE2, artificial rupture of membranes or an elective Caesarean section. No differences were found regarding augmentation with oxytocin or regarding foetal position and breech presentations. It was less common for adolescents to have an incorrect descent of the presenting part, emergency Caesarean section and minor maternal injuries. Instrumental interventions were more frequent in adolescents. No statistically significant differences were found in delay of cervical dilatation, foetal distress, rates of labour dystocia, episiotomy, uterine cervix and severe maternal injuries and complications of the third stage of labour (Table 2).

**Table 2.** Results of univariate analysis of the course of labour group of observed outcomes between the study group (age ≤19 years) or the study subgroup (age ≤17 years) and the control group (age 20-24 years) of primiparous women, Slovenia, 2008-2012.

The course of labour	Control group	Study group		Study subgroup	
	20-24 years (N=12,112)	≤19 years (N=1,413)		≤17 years (N=318)	
	n (%)	n (%)	P*	n (%)	P*
<b>Onset of labour</b>					
Spontaneous	9197 (76.1)	1.152 (81.7)	<0.001	269 (84.6)	0.006
Administration of PGE2	1.451 (12.0)	139 (9.9)	<0.001	25 (7.9)	0.006
Artificial rupture of membranes	971 (8.0)	79 (5.6)	<0.001	16 (5.0)	0.006
Elective Caesarean section	465 (3.8)	40 (2.8)	<0.001	8 (2.5)	0.006
Augmentation with oxytocin	7751 (64.0)	875 (61.9)	0.126	188 (59.1)	0.074
<b>Foetal position</b>					
Occipito-anterior foetal position	10857 (88.7)	1270 (89.2)	0.927	280 (87.8)	0.614
Other foetal head positions	785 (7.4)	89 (6.3)	0.927	25 (7.8)	0.614
Breech presentations	567 (4.6)	61 (4.3)	0.927	14 (4.4)	0.614
<b>Delay of cervical dilatation</b>	252 (2.1)	15 (1.1)	0.09	1 (0.3)	0.028
<b>Incorrect descent of the presenting part</b>	754 (6.2)	67 (4.7)	0.027	16 (5)	0.383
<b>Foetal distress</b>	503 (4.2)	62 (4.4)	0.676	13 (4.1)	0.954
<b>Labour dystocia</b>	84 (0.7)	9 (0.6)	0.808	5 (1.6)	0.067
<b>Instrumental intervention (vacuum, forceps)</b>	556 (4.5)	62 (4.4)	0.001	18 (5.6)	0.040
<b>Emergency Caesarean section</b>	2006 (16.4)	180 (12.6)	0.001	36 (11.3)	0.040
<b>Episiotomy</b>	5432 (44.9)	482 (44.0)	0.872	155 (48.7)	0.169
<b>Maternal injuries</b>					
Minor injuries	2937 (24.2)	298 (21.1)	0.008	75 (23.6)	0.785
Uterine cervix injury	199 (1.6)	25 (1.8)	0.725	9 (2.8)	0.103
Severe injuries	46 (0.4)	4 (0.3)	0.571	0 (0.0)	0.271
<b>Complications of the third stage of labour</b>	420 (3.5)	48 (3.4)	0.891	17 (5.3)	0.073
<b>Labour without complications</b>	8902 (73.5)	1061 (75.1)	0.199	255 (80.2)	0.007

Legend: \* comparison to the control group -  $\chi^2$  test

Median duration of labour was 4 hours in all the study and control groups, while the interquartile range was 3-6 hours. Mann-Whitney test did not show any statistically significant difference among the groups.

### 3.3 The Status of the Newborn

Newborns of adolescents have had more commonly very low birth weight, and were more commonly small for gestational age (SGA). Furthermore, it was less common for newborns of adolescents to have an appropriate newborn's birth weight as well as excessive newborn's birth weight. There was no statistically significant difference in stillbirth or in Apgar score <7 at 1st minute (Table 3).

**Table 3.** Results of univariate analysis of the newborn status group of observed outcomes between the study group (age ≤19 years) or the study subgroup (age ≤17 years) and the control group (age 20-24 years) of primiparous women, Slovenia, 2008-2012.

Status of the newborn	Control group	Study group		Study subgroup	
	20-24 years (N=12,112)	≤19 years (N=1,413)		≤17 years (N=318)	
	n (%)	n (%)	P*	n (%)	P*
Stillbirth	62 (0.5)	7 (0.5)	0.941	0 (0.0)	0.202
Apgar score <7 at 1st minute	453 (3.7)	56 (3.9)	0.659	14 (4.4)	0.522
Apgar score <7 at 5th minute	156 (1.3)	33 (2.3)	0.001	7 (2.2)	0.152
Newborn's birth weight					
Very low newborn's birth weight <1500 g	133 (1.1)	25 (1.8)	<0.001	6 (1.9)	<0.001
Low newborn's birth weight 1500-2499 g	642 (5.2)	108 (7.6)		35 (11.0)	
Appropriate newborn's birth weight 2500-3999 g	10488 (85.7)	1193 (83.8)		265 (83.1)	
Excessive newborn's birth weight ≥4000 g	972 (7.9)	97 (6.8)		13 (4.1)	
Small for gestational age (SGA)	708 (5.8)	104 (7.3)	0.022	31 (9.7)	0.003

Legend: \* comparison to the control group -  $\chi^2$  test

Regarding the newborn's birth weight, the results of multivariate analysis showed that newborns of adolescents aged ≤17 years were on average 120 g lighter, and newborns of adolescent aged 18-19 years were 49 g lighter when adjusted for gestational age, compared to newborns of women aged 20-24 years ( $B=-0.04$  for age group ≤17 years,  $B=-0.03$  for age group 18-19 years; both were statistically significant,  $p<0.001$ ).

Regarding SGA newborns, the results of multivariate analysis showed that full-term newborns were SGA in 10.1% if born to adolescents aged ≤17 years, and in 5.8% if born to adolescents aged 18-19 years, compared to 5.3% if born to women aged 20-24 years. Odds ratio for SGA was 1.8 (1.2-2.8) for adolescents aged ≤17 years ( $p=0.002$ ) and 1.1 (0.8-1.4) for adolescents aged 18-19 years ( $p=0.533$ ).

### 3.4 Prenatal Care

Adolescents have had their first check-up at gynaecologist later in pregnancy; have had less check-ups at gynaecologist and less ultrasonography check-ups during pregnancy. Adolescents also less commonly attended parenting school, but more frequently smoked during pregnancy. It was less common for adolescents to get prenatal screening tests: nuchal translucency or cervix uteri measurement (Table 4).

## 4 DISCUSSION

### 4.1 Summary of the Most Important Results of the Study

Our study revealed that in Slovenia, anaemia in pregnancy was more common in adolescents aged ≤17 years than in women aged 20-24 years. Unknown estimated date of delivery was more common in adolescents, particularly

in the adolescents aged ≤17 years. Preterm birth was also more common in adolescents. Adolescents' newborns had more commonly very low birth weight and low birth weight, they were lighter than newborns of women aged 20-24 years even after adjustment for gestational week. Additionally, full term newborns of adolescents aged ≤17 years were more frequently SGA, odds ratio for SGA was 1.8 (1.2-2.8), compared to full-term newborns of women aged 20-24 years. Last but not least, adolescents had poorer prenatal care. On the other hand, gestational diabetes was less common in adolescents, it was less common for adolescents to have a high gestational weight gain, there was more common spontaneous onset of labour, lower incidences of elective and emergency Caesarean sections in adolescents, and more commonly labour without complications in adolescents aged ≤17 years. There was no statistically significant difference in rates of hypertension and IUGR, nor in the presence of foetal anomalies.

### 4.2 Comparison and Contrast with the Findings of Similar Studies

Our findings on anaemia are congruent with other studies; anaemia is usually attributed to a lower socio-economic status and prenatal care in these women, as well as to a growing need for iron and other haemoglobin substrates (18, 19). Unknown estimated date of delivery could be attributable to the fact that a lot of adolescent women have their first check-up at gynaecologist later than older women, as it was obvious also in our study, and that it is common for adolescent women not to know the date of their last period, since their periods tend to be irregular (20). More frequent preterm birth in adolescents was found also in other studies (21). The mechanisms responsible for

**Table 4.** Results of univariate analysis of prenatal care group of observed outcomes between the study group (age ≤19 years) or the study subgroup (age ≤17 years) and the control group (age 20-24 years) of primiparous women, Slovenia, 2008-2012.

Prenatal care	Control group	Study group		Study subgroup	
	20-24 years (N=12,112)	≤19 years (N=1,413)		≤17 years (N=318)	
	n (%)	n (%)	P*	n (%)	P*
<b>Week of the first check-up at gynaecologist</b>			<0.001		<0.001
First check-up at gynaecologist <12 weeks of pregnancy	9966 (82.3)	888 (62.9)		1174 (54.7)	
First check-up at gynaecologist at 12-22 weeks of pregnancy	1800 (14.9)	370 (26.2)		95 (29.9)	
First check-up at gynaecologist ≥23 weeks of pregnancy	342 (2.8)	154 (10.9)		49 (15.4)	
No check-ups during pregnancy	50 (0.4)	30 (2.1)	<0.001	18 (5.7)	<0.001
<b>Number of check-ups during pregnancy</b>			<0.001		<0.001
1-7 check-ups during pregnancy	1.773 (14.6)	426 (30.1)		124 (39.0)	
8-12 check-ups during pregnancy	8305 (68.6)	810 (57.2)		154 (48.4)	
≥13 check-ups during pregnancy	1.983 (16.4)	147 (10.4)		22 (6.9)	
<b>Number of ultrasonography check-ups</b>			<0.001		<0.001
0-1 ultrasonography check-up	333 (2.8)	122 (8.6)		42 (13.2)	
2 ultrasonography check-ups	1660 (13.7)	284 (20.1)		78 (24.5)	
≥3 ultrasonography check-ups	10116 (83.5)	1006 (71.2)		198 (62.3)	
<b>Parenting school attendance</b>	8431 (69.6)	543 (38.5)	<0.001	68 (21.4)	<0.001
<b>Smoking during pregnancy</b>	2213 (18.3)	457 (32.4)	<0.001	121 (38.1)	<0.001
<b>Nuchal translucency</b>	8007 (66.1)	455 (32.0)	<0.001	45 (14.1)	<0.001
<b>Cervix uteri measurement</b>	937 (7.7)	61 (4.3)	<0.001	10 (3.1)	<0.002

Legend: \* comparison to the control group -  $\chi^2$  test

preterm birth are still unclear: the immaturity of cervical blood supply in young mothers stimulates prostaglandin production that could lead to a preterm birth (22).

More common spontaneous onset of labour in adolescents was observed also by other studies (16, 21). Some researches attributed a lower incidence of Caesarean sections to a lower newborns' birth weight and size of newborns of adolescents (21). There was no difference in foetal positions, breech presentations or in delay of cervical dilatation, which contrasts with studies founding breech presentations to be more common in adolescents (23). Maternal injuries were more common in adolescents, mostly due to higher rates of minor injuries. The study from Sweden, however, showed a significantly lower incidence of perineal rupture in adolescents (24).

We found no statistically significant difference in stillbirth or in Apgar score <7 at 1st minute. Apgar score <7 at 5th minute was more common in newborns of adolescents, compared to women aged 20-24 years. Some studies have found similarly lower Apgar scores in adolescents' newborns (25), while others have not (16). More commonly, very low birth weight and low birth weight in adolescents' newborns was found in many other studies (10, 11, 26), as well as SGA newborns of adolescents (15), but others found

no difference regarding SGA newborns, when comparing adolescents to older women (23). It is interesting that we observed a higher incidence of SGA newborns and preterm births in adolescents, yet we did not observe any statistically significant difference regarding IUGR. This could be attributable to adolescents' late first check-up and poorer follow-up regarding growth restriction, due to a lower number of check-ups in adolescents overall. Not knowing the date of their last period and, consequently, unknown estimated date of delivery also attributes to a higher risk for missed IUGR diagnosis.

In general, adolescent women had their first check-up at the gynaecologist later than older women and a lower rate of regular check-ups and ultrasonography check-ups during pregnancy. A lower number of pregnancy check-ups could be due to the fact that adolescents make a later first check-up at the gynaecologist than older women, have higher incidence of preterm births, and that their check-ups are most frequent towards the end of pregnancy. More than two thirds of women aged 20-24 years and only one third of adolescents attended parenting school. A similar study has shown that adolescents in Slovenia have a poorer psychological readiness for pregnancy, lower education, and often live in rural areas and have poorer prenatal care



compared to older women. All of this attributes to a lower percentage of parenting school attendance (27). A higher prevalence of smoking during pregnancy in adolescents is congruent with other studies (28). Smoking has been recognised as an important risk factors for having SGA newborns (29) and has also been linked to a higher incidence of low birth weight newborns (30). We observed a much higher incidence in nuchal translucency in women aged 20-24 years than in adolescents. This could be due to a later first check-up in adolescents and, therefore, a missed time frame for nuchal translucency. Also, cervix uteri measurement was more common in women aged 20-24 years than in adolescents, which we could not explain with the current data.

Adolescents were more frequently underweight before pregnancy than older women. Moreover, the incidence of a low gestational weight gain was higher in adolescents. Studies have shown that adolescents with gestational weight gain under the recommendations, however, had decreased odds of having an LGA newborn and increased odds of having an SGA newborn (31). Moreover, they had increased odds of preterm birth and infant death (32). A lower gestational weight gain in adolescents could be attributable to the fact that many adolescents exhibit long bone growth during pregnancy and pelvic immaturity. This growth may lead to competition between mother and foetus for nutrients, suggesting that adolescents may require greater gestational weight gain than adult women to optimize outcomes in pregnancy (33).

### 4.3 Limitations and Strengths of the Study

Limitations of our study could be found in mainly only univariate analysis and less proper comparison of two distant age groups; more data could be additionally analysed with multiple regression. With our study, we gained new insights into population of pregnant adolescents in Slovenia; new knowledge is the strength of this study.

### 4.4 Implications of the Study Results for Obstetrics and Public Health

The results of our study confirmed that adolescent pregnancy is related to higher health risks for pregnant adolescents and their newborns. Poor prenatal care of adolescents could be improved with better health education and counselling of adolescents in reproductive health (e.g. reproductive cycle, contraception, nutrition, smoking...), in addition to more frequent and intense health and social service given to pregnant adolescents.

### 4.5 Suggestions for Future Research in the Field

The research on factors of poorer prenatal care in adolescents could be the challenge for future research.

## 5 CONCLUSIONS

There are differences regarding pregnancy and pregnancy outcomes between adolescents and women aged 20-24 years. These differences should be taken into consideration by health professionals when encountering adolescent pregnant women. Health professionals should intensify prenatal care at first encounter with pregnant adolescents in terms of regular medical check-ups and psychosocial counselling and support.

## CONFLICT OF INTEREST

The authors declare that no conflicts of interest exist.

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## ETHICAL APPROVAL

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