Teenage Childbearing as an Independent Risk Factor for Stress Urinary Incontinence in American Women

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Purpose: To evaluate the associations among teenage childbearing (Age at first birth<=19 years old) with later-life risk of stress and urgency urinary incontinence (SUI, UUI) in American women using nationally representative data from America.

Materials and Methods: Data from the National Health and Nutrition Examination Survey (NHANES) from 2015 to 2018 were merged to include 2673 women. The question, "How old were you at the time of your first live birth?" was used to assess teenage childbearing. Urinary incontinence was ascertained by self-report. Multivariable logistic regression models were used to assess the association between teenage childbearing and urinary incontinence in American women, controlling for potential confounders.

Results: Among the 2673 women with complete data, the prevalence of SUI was 27.3%, and the prevalence of UUI was 22.1%. Overall, 856 of female had given birth at or before the age of nineteen. Teenage childbearing was significantly associated with SUI (OR=1.9, 95%CI=1.5-2.3, $p < 0.001$), but teenage childbearing was not associated with UUI (OR=1.2, 95%CI=1.0-1.5, $p = 0.0658$).

Conclusion: After controlling for known risk factors, teenage childbearing seems to be signif-icantly related to female stress urinary incontinence.

Keywords: teenage childbearing; stress incontinence; urgency incontinence; urinary inconti-nence; women.

INTRODUCTION

According to ICS terminology, urinary incontinence(UI) is a complaint of any involuntary leakage of urine[(1)]. Two main types are described: stressurinary incontinence(SUI), in which urine leaks in association with physical exertion, and urgency urinary incontinence(UUI),in which urine leaks in association with a sudden compelling desire to void[(2)]. Urinary incontinence symptoms are highly prevalent among women[(3)], have a substantial effect on health-related quality of life and are associated with considerable personal and societal expenditure. Age, obesity, gravidity, hypertension and menopause are known to be risk factors for stress UI in women[(4)]. Additionally, many studies have identified diabetes mellitus as a risk factor for in-continence in women[(5)]. Obstetric risk factors are well defined in the literature, and parities are shown to increase UI risk by 67%[(6)]. In addition, vaginal delivery increased the risk of UI by 75% compared to c-sections[(7)].

Teenage childbearing is a major adolescent health concern worldwide. World Health Organi-zation (WHO) defines the age group 10–19 years as adolescents stage[(8)]. The prevalence of teenage pregnancy remains high worldwide, despite recent prevention efforts, such as promo-tion of contraception use and sexual education[(9)]. Teenage births result in health consequences; children are more likely to be born pre-term, have lower birth weight, and higher neonatal mortality[(10)], while mothers experience greater rates of post-partum depression[(11)] and are less likely to initiate breastfeeding[(12)]. Teenage mothers are less likely to complete high school, are more likely to live in poverty, and have children who frequently experience health and devel-opmental problems[(13)].

Although UI is associated with pregnancy and parity(14), few studies reveal the associations among teenage childbearing with SUI and UUI. The National Health and Nutrition Examina-tion Survey (NHANES) represents a population-based sample of American adults who com-pleted validated urinary symptom questionnaires in select years and an assessment of self-reported ageat first live birth. Hence, we used the data of the NHANES program to in-vestigating the relationship between early childbearing and later risk of UI. The focus of our paper is on longer term adult health outcomes of teen mothers. A better understanding of how UI is associated with teenage childbearing is important for clinical practice and public health interventions aimed

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Received February 2022 & Accepted June 2022

Table 1. Weighted population prevalence rates of stress and urgency incontinence (n=2673)

Demographics	Prevalence rates of Incontinence (self-reported) SUI%(95CI%)	UUI%(95CI%)
Overall prevalence	27.3(26.3-29.8)	22.1(20.5-23.7)
Age		
20-39	20.8(17.6-24.0)	13.1(10.4-15.7)
40-59	28.2(25.4-31.1)	19.1(16.6-21.6)
60-79	30.9(27.7-34.0)	28.7(25.7-31.8)
80+	37.6(30.9-44.4)	36.1(29.5-42.8)
Race		
Mexican american	32.4(28.2-36.6)	23.1(19.3-26.9)
Other hispanic	27.1(22.3-31.9)	17.5(13.4-21.6)
Non-hispanic white	33.6(30.5-36.7)	25.4(22.6-28.3)
Non-hispanic black	18.4(15.7-21.9)	21.9(18.6-25.3)
Other race-including multi-racial	24.6(19.9-29.3)	16.5(12.4-20.6)
Education		
Less than High School	29.9(26.4-33.4)	24.6(21.3-27.9)
High school/ged	30.8(27.2-34.5)	21.5(18.2-24.7)
College	25.9(23.6-28.2)	21.2(19.0-23.4)
Annual family income		
$0 to $19,999	29.9(26.5-33.3)	22.6(19.4-25.7)
$20,000 to $34,999	28.3(24.8-31.7)	24.3(21.0-27.6)
$35,000 to $74,999	27.1(23.8-30.4)	21.0(26.3-29.8)
> $75,000	26.8(23.2-30.4)	20.4(17.2-23.7)
Bmi		
Lean/normal (<25 kg/m^2)	22.7(19.5-26.0)	22.4(19.2-25.6)
Overweight (25-30 kg/m^2)	28.7(25.5-31.9)	23.9(20.9-26.9)
Obese (>30 kg/m2)	30.5(27.9-33.1)	20.8(18.5-23.1)
Parity		
1	28.2(24.1-32.2)	20.9(17.3-24.6)
2	31.3(28.2-34.4)	23.4(20.6-26.2)
3	25.6(22.2-29.0)	20.5(17.4-23.6)
4	26.7(22.1-31.3)	22.5(18.2-26.8)
>=5	25.2(20.0-30.3)	23.4(18.4-28.4)

at preventing teenage pregnancy.

Methods

NHANES Sample and Design

The NHANES program consists of cross-sectional health surveys performed by the National Center for Health Statistics of the Centers for Disease Control and Prevention (http://www.cdc.gov/nchs/nhanes.htm). NHANES provides estimates of the health status of the United States population by selecting a nationally representative sample of the noninstitution-alized population using a complex, stratified, multistage, probability cluster design. NHANES oversampled individuals 60 years old or older and black, Mexican-American, and low-income white individuals to provide more reliable estimates of these groups. The National Centers for Health Statistics ethics review board approved the protocol, and all participants provided written informed consent. We obtained nationally representative data on demographic and health outcomes from NHANES 2015-2018. This study was a cross-sectional survey, which was carried out to investigate the relationship between teenage childbearing and UI among women.

Study participants

We used publicly available data from the 2015-2018 NHANES for this study. NHANES rep-resents a population-based sample of American adults who completed validated urinary symptom questionnaires in select years. We restricted our analytic cohort to include female, aged 20 years or older when participating in NHANES, who responded to the “Kidney Con-ditions – Urology” survey questionnaire and “Reproductive Health” survey questionnaire (n=3949). We excluded 257 participants who reported a history of bladder cancer (n=5), brain cancer (n=1), cervical or uterine cancer (n=66), stroke (n=185) since bladder cancer, brain cancer, cervical or uterine cancer and stroke may affect urinary function. Participants with in-complete general survey data (n=1055) were also excluded. Ultimately, 2637 women were included in the present study. For this study, a sample size calculation based on error margin of 5%, 95% confidence level and expected ratio of SUI or UUI of 50% was run at the sample size calculator website: http://www.surveysystem.com/sample-size-formula.htm , and the result was found to be 377. This study had a respectable sample size(2637).

Study Variables

Questions regarding UI were assessed by computer-assisted personal interviews methodolo-gy (CAPI). The primary outcome of interest was the presence of either SUI or UUI ("any in past year")as ascertained by self-report. Participants were asked if “During the past 12 months, have you leaked or lost control of even a small amount of urine with activity like coughing, lifting, or exercise?”(SUI) or “with an urge or pressure to urinate and could not get to the toilet fast enough?” (UUI). And, the question: “How frequently does this occur?” measures incon-tinence frequency. We performed a companion analysis defining SUI and UUI as a self-report of monthly or more, and weekly or more incontinence events. The use of this self-reported in-continence questionnaire is considered to be a reliable and valid epidemiological tool for as-sessing the presence of incontinence[15]. Women without the specific incontinence type of in-terest (SUI or UUI) were considered non-cases. According to the response to the question, “how old were you at the time of first live birth?”, we derive variables indicating whether the individual gave birth during teenager.

Table 2. Results of subgroup analyses

Sub-group	N	SUI OR	(95CI)	*P* value	UUI OR	(95CI)	*P* value
Age							
20-39	619	1.6	(1.0, 2.4)	0.0353	1.3	(0.8, 2.2)	0.2842
40-59	967	2.1	(1.5, 2.9)	<0.0001	1.3	(0.9, 1.8)	0.1732
60-79	849	1.7	(1.2, 2.4)	0.0015	1.1	(0.8, 1.5)	0.5867
80+	202	1.3	(0.7, 2.5)	0.465	0.9	(0.5, 1.8)	0.8478
Race							
0n-hispanic black	481	3.1	(1.9, 4.8)	< 0.0001	1.3	(0.8, 2.0)	0.3137
0n-hispanic white	332	2.1	(1.2, 3.6)	0.0091	1.3	(0.7, 2.5)	0.349
Mexican american	897	1.2	(0.9, 1.6)	0.2635	0.9	(0.7, 1.3)	0.756
Other hispanic	606	2.1	(1.3, 3.4)	0.0021	1.8	(1.2, 2.8)	0.0084
Other race including multiracial	321	2.3	(1.2, 4.5)	0.0114	1.4	(0.7, 2.8)	0.3669
Education level							
College	655	2.5	(1.7, 3.6)	< 0.0001	1.8	(1.2, 2.7)	0.0032
High school/ged	620	1.7	(1.2, 2.5)	0.0067	1.2	(0.8, 1.8)	0.3612
Less than high school	1362	1.7	(1.3, 2.2)	0.0004	1	(0.8, 1.4)	0.7729
Annual family income							
> $75,000	696	2	(1.4, 2.9)	0.0004	1.3	(0.9, 1.9)	0.1827
$0 to $19,999	654	1.6	(1.1, 2.3)	0.0209	1.2	(0.8, 1.7)	0.4342
$20,000 to $34,999	705	1.8	(1.2, 2.6)	0.0022	1.4	(1.0, 2.1)	0.0807
$35,000 to $74,999	582	2	(1.3, 3.1)	0.0012	1.1	(0.7, 1.7)	0.7517
BMI							
>30 kg/m^2	647	1.6	(1.0, 2.4)	0.0425	1.1	(0.7, 1.6)	0.7961
<25 kg/m^2	770	1.7	(1.2, 2.5)	0.0022	1.4	(0.9, 2.0)	0.0917
25-30 kg/m^2	1220	2.1	(1.6, 2.7)	<0.0001	1.3	(0.9, 1.7)	0.1358
Hypertension							
Yes	1297	1.9	(1.4, 2.4)	< 0.0001	1.3	(1.0, 1.7)	0.1006
No	1340	1.7	(1.3, 2.3)	0.0001	1.2	(0.9, 1.6)	0.3582
Parity							
1	483	2	(1.1, 3.6)	0.0168	1.3	(0.7, 2.3)	0.4186
2	868	1.8	(1.2, 2.7)	0.0019	1.1	(0.7, 1.6)	0.7353
3	648	1.3	(0.9, 1.9)	0.15	1.3	(0.9, 2.0)	0.1675
4	360	2.3	(1.4, 3.7)	0.0007	1.5	(0.9, 2.5)	0.0955
>=5	278	2.3	(1.3, 3.9)	0.0036	1.3	(0.8, 2.4)	0.2964
Diabetes							
Yes	529	1.5	(1.0, 2.3)	0.0296	1.1	(0.8, 1.7)	0.5414
No	2108	2	(1.6, 2.5)	< 0.0001	1.3	(1.0, 1.6)	0.0343
Smoking history							
Yes	892	1.8	(1.3, 2.4)	0.0002	1.4	(1.0, 1.9)	0.052
No	1745	1.9	(1.4, 2.4)	< 0.0001	1.2	(0.9, 1.5)	0.227

CI: confidence interval; OR: odds ratio; BMI: body mass index.

In addition, the following covariates were included: age; race; education; annual family income; BMI; hypertension; diabetes; parity; smoking history and history of hysterectomy. Those co-variates included demographic and clinical characteristics that have been associated with UI in prior studies(16-19). Details of all study variables acquisition process are available at www.cdc.gov/nchs/nhanes/.

Statistical analysis

All estimates were calculated accounting for NHANES sample weights(full sample 4-year MEC examination weight of the 2015–2018). These weights consider unequal probabilities of selec-tion and nonresponse. The subgroup analysis was carried out using stratified multivariate re-gression analysis. Following adjustment for covariates, we used logistic regression to examine the independent association among teenage childbearing with stress and urgency urinary in-continence (SUI, UUI). Data were analyzed with the use of the statistical packages R (The R Foundation; http://www.r-project.org; version 3.4.3) and Empower (R) (www.empowerstats.com, X&Y solutions, inc. Boston, Massachusetts). The OR and 95% CI were obtained from the multivariable models with statistical significance considered at p <0.05.

RESULTS

prevalence rates of stress and urgency incontinence

Overall, the study included 2673 women. The population prevalence of SUI was 27.3%(26.3%-29.8%) and UUI was 22.1%(20.5%-23.7%).

Subgroups analyses

To examine whether the associations among teenage childbearing (Age at first birth < =19 years old) with stress and urgency urinary incontinence (SUI, UUI) existed across subgroups, uni-variate logistic regression was adopted for subgroup analyses (**Table 2**). No increased risks of SUI were found among participants whose age >=80 years old (P-value = 0.465), who belong to Mexican American (p = 0.2635), whose parity is three (p = 0.15). However, increased risks of SUI were observed in all the other subgroups (P < 0.05). Increased odds of UUI were only found among participants who belong to other race including multiracial (p = 0.0084), whose education level is college (p = 0.0032), who didn't have diabetes (p = 0.0343).

Teenage childbearing was associated with the odds of

SUI in women

Four regression models were constructed: Adjust 0 model adjust for: none. Adjust 1 model adjust for: age; race; education; annual family income. Adjust 2 model adjust for: BMI; hy-pertension; diabetes; parity; smoking history; history of hysterectomy; post-menopausal

Table 3. Associations between teenage childbearing and urinary incontinence among women in NHANES 2015–2018 (n = 2673)

	Adjust 0 OR (95%CI)	*P*	Adjust 1 OR (95%CI)	*P*	Adjust 2 OR (95%CI)	*P*	Adjust 3 OR (95%CI)	*P*
SUI								
Age at first birth>19	Ref		Ref		Ref		Ref	
Age at first birth<=19	1.8 (1.5, 2.2)	< 0.001	1.8 (1.4, 2.2)	< 0.001	1.9 (1.5, 2.3)	< 0.001	1.9 (1.5, 2.3)	< 0.001
UUI								
Age at first birth>19	Ref	0.0334	Ref	0.108	Ref	0.067	Ref	0.0658
Age at first birth<=19	1.2 (1.0, 1.5)		1.2 (0.9, 1.4)		1.2 (1.0, 1.5)		1.2 (1.0, 1.5)	

Adjust 0 model adjust for: none. Adjust 1 model adjust for: age; race; education; annual family income. Adjust 2 model adjust for: BMI; hypertension; diabetes; parity; smoking history; history of hysterectomy; post-menopausal status. Adjust 3 model adjust for: age; race; education; annual family income; BMI; hypertension; diabetes; parity; smoking history; history of hysterectomy.

status. Adjust 3 model adjust for: age; race; education; annual family income; BMI; hypertension; diabetes; parity; smoking history; history of hysterectomy (**Table 2**). In the fully-adjusted model, we observed a positive association between teenage childbearing and SUI (OR=1.9, 95% confidence interval [CI]: 1.5-2.3, $P < 0.05$), and SUI will come up early in the life of these women (Age: 20-39, OR=1.6, 95% confidence interval [CI]: 1.0-2.4, $P < 0.05$). However, teenage childbearing were not found to be associated with UUI (OR = 1.2, 95% confidence interval [CI]: 1.0-1.5, $P = 0.0658$).

DISCUSSION

The present study aimed to evaluate the associations among teenage childbearing (Age at first birth<=19 years old) with SUI and UUI in American women. In this study, we found that the risk of SUI was 1.9 times higher in women whose age at first live birth less than or equal to 19 years old than in women whose age at first live birth more than 19 years old in adulthood. However, after fully adjusting for multiple risk factors, we also found no relationship between teenage childbearing and UUI.

The risks and realities associated with teenage childbearing are well documented[20]; for exam-ple, Children are more likely to be born prematurely, have lower birth weight and have higher neonatal mortality[21], and teenage mothers have higher rates of postpartum depression and are less likely to start breastfeeding[22]. Hoffman et al. reported that Teenage mothers are less likely to finish high school, more likely to live in poverty, and children often experience health and developmental problems. Despite the historic decline in the U.S. teen birth rate during 1991–2015, from 61.8 to 22.3 births per 1,000 females aged 15–19 years, many teens continue to have repeat births[23]. These previous studies, along with ours, suggest that teenage childbearing may pose a significant public health hazard. To the best of our knowledge, this is the first study that explored the associations between teenage childbearing and urinary incon-tinence.

UI can seriously affect one's quality of life[24]. SUI is an involuntary loss of urine due to in-creased intra-abdominal pressure, while UUI is caused by stimulation of bladder contractions or loss of nervous system control. In previous studies, parity[25], mode of delivery[26] and difficult birth history[27] were risk factors for UI.

No statistically significant interactions were observed between teenage childbearing and UUI ($P = 0.0068 > 0.05$), but p values between 0.05 and 0.10 were reported as marginally significant in many studies. So more studies are needed to estimate the relationship of UUI and teenage childbearing.

We found SUI increases in women whose age at first birth less than or equal to 19 years old. Based on our findings, we propose several possible hypotheses. The first is that anatomical differences in pelvis dimensions, uterine volume and hormone production between adolescents and adults[28,29] may increase the risk of pelvic floor dysfunctions after delivery, and the use of episiotomy[29] may worsen this condition. The second hypothesis is that adolescent pregnancy is often unplanned,being associated with fewer appointments, which usually start when the pregnancy is already advanced, and with lower follow-up rates compared with adult pregnan-cies[30]. Lack of knowledge of available prenatal care services, lack of decision-making au-tonomy, concealment of pregnancy, and financial difficulties may justify this association. Ad-olescents tend not to follow medical recommendations correctly, and are more exposed to poor nutrition, drug use, smoking and alcohol consumption, as well as emotional stress[31]. None-theless, our hypotheses require further investigation.

Strengths of this study include the nationally representative nature of the NHANES data and the large sample size, yet there are some limitations to our study. First, the cross-sectional nature of this study inhibits our ability to assess causality. Second, other confounders such as histories of gynaecological disease and previous instrumental vaginal delivery were not included in or controlled for in our analyses. Lastly, prevalence-incidence bias was also a problem we couldn't solve. This study does not provide further insight into the major mechanisms of progression and exacerbation of SUI from teenage childbearing. Future longitudinal studies are needed to examine the association of SUI with teenage childbearing.

CONCLUSIONS

These results show that teenage childbearing was not related to UUI. However, an increased risk of SUI was demonstrated in participants whose age at first live birth

less than or equal to 19 years old. Our findings emphasize the need for physicians and nurses to recommend proper treatment, medical help, or bring the disorder to light for teenage mothers.

ACKNOWLEDGMENTS

This work was supported by the National Natural Science Foundation of China to Fei Gao [NO. 81672893] and Mei Yang [NO. 81971230, 81671312]. Furthermore, it is supported by Chongqing Science and health joint project [NO. 2020GDRC007], and supported by Senior Medical Talents Program of Chongqing for Yong and Middle-aged [NO. 204216qn] and Re-serve Talents Program for academic Leaders of the First Affiliated Hospital of Chongqing Medical University [NO. XKTS070] to Fei Gao.

CONFLICT OF INTEREST

The authors report no conflict of interest.

REFERENCES

1. Haylen BT, de Ridder D, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminol-ogy for female pelvic floor dysfunction. Neurourol Urodyn. 2010;29:4-20.
2. Aoki Y, Brown HW, Brubaker L, Cornu JN, Daly JO, Cartwright R. Urinary inconti-nence in women. Nat Rev Dis Primers. 2017;3:17042.
3. Milsom I, Gyhagen M. The prevalence of urinary incontinence. Climacteric. 2019;22:217-22.
4. Schreiber Pedersen L, Lose G. Prevalence of urinary incontinence among women and analysis of potential risk factors in Germany and Denmark. 2017;96:939-48.
5. Lawrence JM, Lukacz ES, Liu IL, Nager CW, Luber KM. Pelvic floor disorders, dia-betes, and obesity in women: findings from the Kaiser Permanente Continence Asso-ciated Risk Epidemiology Study. Diabetes Care. 2007;30:2536-41.
6. Danforth KN, Townsend MK, Lifford K, Curhan GC, Resnick NM, Grodstein F. Risk factors for urinary incontinence among middle-aged women. Am J Obstet Gynecol. 2006;194:339-45.
7. Gyhagen M, Åkervall S, Molin M, Milsom I. The effect of childbirth on urinary incontinence: a matched cohort study in women aged 40-64 years. Am J Obstet Gynecol. 2019;221:322.e1-.e17.
8. [No authorlisted]. Programming for adolescent health and development. Report of a WHO/UNFPA/UNICEF Study Group on Programming for Adolescent Health. World Health Organ Tech Rep Ser. 1999;886:i-vi, 1-260.
9. Leftwich HK, Alves MV. Adolescent Pregnancy. Pediatr Clin North Am. 2017;64:381-8.
10. Gurung R, Målqvist M. The burden of adolescent motherhood and health consequences in Nepal. 2020;20:318.
11. McCracken KA, Loveless M. Teen pregnancy: an update. Curr Opin Obstet Gynecol. 2014;26:355-9.
12. Puapompong P, Raungrongmorakot K, Manolerdtewan W, Ketsuwan S, Wongin S. Teenage pregnancy and exclusive breastfeeding rates. J Med Assoc Thai. 2014;97:893-8.
13. Fahy K. Poverty, welfare and single teenage mothers: a primary health care concern. Aust Coll Midwives Inc J. 1995;8:19-23.
14. Connolly TJ, Litman HJ, Tennstedt SL, Link CL, McKinlay JB. The effect of mode of delivery, parity, and birth weight on risk of urinary incontinence. Int Urogynecol J Pelvic Floor Dysfunct. 2007;18:1033-42.
15. Brown JS, Vittinghoff E, Lin F, Nyberg LM, Kusek JW, Kanaya AM. Prevalence and risk factors for urinary incontinence in women with type 2 diabetes and impaired fasting glucose: findings from the National Health and Nutrition Examination Survey (NHANES) 2001-2002. Diabetes Care. 2006;29:1307-12.
16. Pang H, Lv J, Xu T, et al. Incidence and risk factors of female urinary incontinence: a 4-year longitudinal study among 24 985 adult women in China. Bjog. 2022;129:580-9.
17. Wang W, Peng L, Gao X, Luo D. The Frequency of Metabolic Syndrome in Aged Female Patients (Older Than 65 Years) With and Without Stress Urinary Incontinence: A Case-Control Study. Female Pelvic Medicine & Reconstructive Surgery. 2022;28:e11-e5.
18. Martins Reis A, Oliveira Brito LG, Barbosa Lunardi AL, Carvalho de Araújo C, Teatin Juliato CR. Factors Associated With Myofascial Dysfunction of the Pelvic Floor Mus-cles in Women With Urinary Incontinence: A Cross-Sectional Study. Female Pelvic Medicine & Reconstructive Surgery. 2021;27:691-6.
19. Sundqvist C, Li X. Sociodemographic Disparities and Parity in Relation to Urinary Incontinence: A Nationwide Primary Healthcare Cohort Study (1997-2018). 2022;11.
20. Wall-Wieler E, Roos LL, Nickel NC. Teenage pregnancy: the impact of maternal ad-olescent childbearing and older sister's teenage pregnancy on a younger sister. BMC Pregnancy Childbirth. 2016;16:120.
21. Chen XK, Wen SW, Fleming N, Demissie K, Rhoads GG, Walker M. Teenage pregnancy and adverse birth outcomes: a large population based retrospective cohort study. Int J Epidemiol. 2007;36:368-73.
22. Kingston D, Heaman M, Fell D, Chalmers B. Comparison of adolescent, young adult, and adult women's maternity experiences and practices. Pediatrics. 2012;129:e1228-37.
23. Dee DL, Pazol K, Cox S, et al. Trends in Repeat Births and Use of Postpartum Contraception Among Teens - United States, 2004-2015. MMWR Morb Mortal Wkly Rep. 2017;66:422-6.
24. Irwin DE, Milsom I, Chancellor MB, Kopp Z, Guan Z. Dynamic progression of overactive

bladder and urinary incontinence symptoms: a systematic review. Eur Urol. 2010;58:532-43.
25. Zhou HH, Shu B, Liu TZ, Wang XH, Yang ZH, Guo YL. Association between parity and the risk for urinary incontinence in women: A meta-analysis of case-control and cohort studies. Medicine (Baltimore). 2018;97:e11443.
26. Chang SR, Chen KH, Lin HH, Lin MI, Chang TC, Lin WA. Association of mode of delivery with urinary incontinence and changes in urinary incontinence over the first year postpartum. Obstet Gynecol. 2014;123:568-77.
27. Yagmur Y, Gul S. Urinary incontinence in women aged 40 and older: Its prevalence, risk factors, and effect on quality of life. Niger J Clin Pract. 2021;24:186-92.
28. Sharma K, Gupta P, Shandilya S. Age related changes in pelvis size among adolescent and adult females with reference to parturition from Naraingarh, Haryana (India). Homo. 2016;67:273-93.
29. Alves JG, Cisneiros RM, Dutra LP, Pinto RA. Perinatal characteristics among early (10-14 years old) and late (15-19 years old) pregnant adolescents. BMC Res Notes. 2012;5:531.
30. Chotigeat U, Sawasdiworn S. Comparison outcomes of sick babies born to teenage mothers with those born to adult mothers. J Med Assoc Thai. 2011;94 Suppl 3:S27-34.
31. Queiroz MVO, Menezes GMD, Silva TJP, Brasil EGM, Silva RMD. Pregnant teen-agers' group: contributions to prenatal care. Rev Gaucha Enferm. 2017;37:e20160029.