

The Prevalence, Subtypes and Obstetric Risk Factors of Urinary Incontinence in Reproductive Age Women Referred to Community Health Care Centers of Dezful, Iran- 2015

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ABSTRACT

Background: Urinary incontinence (UI) is a common health problem and has a profound effect on the quality of life and psychosocial aspects of the affected women. The aim of this study was to investigate the prevalence and risk factors of UI in reproductive age women.

Methods: This cross-sectional study was conducted on 2000 reproductive age women from February to June 2015. The women were selected from all of the primary health care centers of Dezful, using easy access sampling method. Body mass index (BMI) was measured and data were collected by demographic, detailed information regarding obstetric and International Consultation on Incontinence Questionnaire- Urinary incontinence – Short Form (ICIQ-SF) ICIQ-SF questionnaires.

Results: The women's mean age was 33.6±8, and 57.7% (1154) of them reported UI. The prevalence of UI subtypes was recorded in 38.2% (441) stress UI (SUI), 44.9% (518) mixed UI, and 16.9% (195) urge UI. There was a significant association between the mean of pregnancies, mean of deliveries, mode of delivery, abortion, neonate >4 kg, irregular menstruation and UI (P<0.05). Multiple logistic regression analysis showed that age, irregular menstruation and vaginal delivery increased the risk of UI in this age group.

Conclusion: The findings suggest that a significant proportion of reproductive age women were undiagnosed with UI and MUI was the most common type of UI in this age group. Regular menstruation was a protective factor but older age and vaginal delivery were risk factors for UI in this study.

KEYWORDS: Urinary incontinence, Prevalence, Reproductive age

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INTRODUCTION

Genitourinary problems are the most common complaints of adult women and are capable of affecting all aspects of their life. Urinary incontinence (UI) is one of the most significant chronic complaints and a prevalent condition. It is a physical, psychological, social and economical problem,¹ and is also an interdisciplinary subject which is of interest to different specialists.

UI is associated with disorders such as familiar problems, embarrassment, anxiety, depression, sexual dysfunction, diminished quality of life and high cost.²⁻⁴ It is estimated that direct economic cost of incontinence in all ages is over \$16 billion annually.⁵ The prevalence and risk factors affecting UI are often important for health researchers, policy makers and clinicians to improve the management, treatment and assessment of the disease burden of the affected individuals.⁶ Epidemiological studies on the prevalence of UI in developing countries are scanty, but it is estimated that almost a third of parous women have UI (28.7%). The reported prevalence of UI in high income countries is 27.6% in comparison with developing countries (28.7% with a range of 5.2 – 70.8%).⁶⁻⁸ The prevalence of UI is estimated to be 12-69%⁹ and for the middle aged women, it is estimated to be between 25-45% for any UI and 50% in older women, but limited data are available in reproductive age women.¹⁰ A few studies have estimated the prevalence of UI as 38.4% in 40-50 and 23.5% in 15-50 year old women in Iran.^{11,12}

The wide prevalence rate of UI is due to differences in the methods of data collection, definition of UI, and study populations. Therefore, precise estimates of UI prevalence could be obtained from representative populations and do not focus on UI and the use of a valid international questionnaire.^{13,14} The most common forms of UI are typically classified as stress UI (SUI), urge UI (UUI), and mixed UI (MUI). UI has a wide range of risk factors such as age, race, parity, increased body mass index (BMI), smoking, etc. that are

well accepted and described in most studies.^{15,16} However, the majority of these researches were conducted in clinics and had clinical-based samples with UI. Therefore, this study was performed in community primary health care centers of Dezful in the southwest of Iran (2015), to estimate the current prevalence rate of UI and identify demographic and obstetric associated risk factors.

MATERIALS AND METHODS

Study Design

This cross-sectional study was conducted from February to June 2015 to investigate the prevalence and risk factors of UI in 15-49 year old reproductive age women attending the community health care centers of Dezful.

Setting and Sample

The prevalence rate of UI was assumed 10% which was close to the lowest prevalence rate in the world.^{1,8}

$$n = \frac{Z_{1-\alpha/2} \cdot P(1 - P)}{d^2}$$

Dezful is located in the southwest of Iran. It is the second largest city of Khoozestan province with an estimated urban population of 300000, of whom 47% are women.

In Iran, community based primary health care centers are the main and first level of health service delivery in urban districts. These centers cover a broad range of primary prevention and primary care services within the community and the number of these centers is based on the population of each city.

According to the sample size formula, a representative sample consisting of 2000 women were recruited from all of the main primary health care centers of Dezful (7 centers) based on the population of reproductive age women covered by each center in an equal proportion ($\alpha=0.05$, $d=0.01$ and 10% missing). The only inclusion criterion was age between 15 to 49 years old and the exclusion criteria were pregnancy, physical or mental disability,

child delivered within the previous 3 months, incontinence due to reversible causes and other associated diseases. The participants were selected using easy access sampling method and every reproductive age women attending these centers for any reason (vaccination of their children,...) were informed about the study. Informed written consent was obtained from 2000 women who agreed to take part in this study until the necessary participants in each center were recruited. BMI was calculated and demographic data and obstetric characteristics were collected using a questionnaire designed by the researcher and international consultation on incontinence questionnaire – short form (ICIQ-SF).

Ethical Considerations

Ethical approval for the study was obtained from the ethics committee of Ahvaz Jundishapur University of Medical Sciences (approval no: AJUMS.Rec.1394.151). Written informed consent was obtained from the participants before enrollment.

Measurement

ICIQ-SF developed by international consultation on incontinence was used to categorize the women into continent and incontinent groups. This instrument was translated and validated into Persian by Hajebrahimi et al. They administered the translated and back translated version of the ICIQ to 123 patients complaining from UI; also, psychometric properties of the questionnaire were assessed and compared with full urodynamics study's findings. The calculated Cronbach alpha of the Persian version of the questionnaire was 0.75 which showed to have an acceptable reliability.¹⁷ A woman was defined as having UI if she responded "yes" to the following question: "Did you experience any urine leakage at least once during the past four weeks?" The answers resulted in a sum, with minimum score of 0, and maximum score of 21. Preliminary cut-off scores were set as 0="no incontinence" and 1="urinary incontinence." UI subtypes

were categorized into 3 groups (SUI, mixed UI and UUI)^{18,19} based on the responses to the questions.

Data Analysis

In this study, SPSS software, version 16, was used. Descriptive statistics were used and the univariate analysis was made using a Chi-squared test for categorical data. t-test and ANOVA were used for continuous data. Variables that had a statistically significant effect between continent and incontinent women were included in a multiple logistic regression analysis to determine which factors remained associated with UI. Statistical significance was defined as $P < 0.05$.

RESULTS

The mean age of the participants was 33.6 ± 8.75 y/o and the mean BMI was 26.45 ± 4.24 (overweight). In this study, 98% of women were married and most of them were housewives and highly educated. The overall prevalence of UI was 57.7%. The mean number of pregnancies and deliveries was 1.89 ± 1.95 and 1.72 ± 1.42 , respectively. Table 1 shows the demographic and obstetric characteristics of the entire population of the participating women and women with and without UI and compares the risk factors by univariate analysis; it also shows its relationship with the types of UI.

The mean age of the continent and incontinent women was 32.2 ± 8.2 (yr) and 34.5 ± 7.98 (yr), respectively and their BMI was 25.97 ± 4.17 (Kg/m^2) and 26.77 ± 4.26 (Kg/m^2). Of the 1154 incontinent women, 441 (38.2%) had SUI, 195 (16.9%) had UUI and 518 (44.9%) had MUI. Only 17 (0.85%) had reported their symptoms to a physician. Variables were analyzed using Chi-square test and only those with statistically significant differences were included in the logistic regression. Some socio-demographic and obstetric factors such as age ($P < 0.001$), BMI ($P = 0.005$), mean of pregnancy ($P < 0.001$), mean of deliveries ($P = 0.006$), mode of delivery ($P < 0.001$), abortion ($P = 0.003$), neonate $> 4\text{kg}$ ($P = 0.024$)

Table 1: Demographic and obstetric characteristics of women with and without UI and subtype of UI

Age (yr)	Continent - Incontinent			P value	Type of UI			P value
	Total N (%)	Continent N (%)	Incontinent N (%)		SUI N (%)	UUI N (%)	MUI N (%)	
Demographic characteristics								
<25	420 (21)	206 (24.3)	214 (18.5)	<0.001*	64 (15.2)	48 (11.4)	102 (24.3)	<0.001*
25-37	906 (45.3)	417 (49.3)	489 (42.4)		201 (22.2)	90 (9.9)	198 (21.9)	
>38	674 (33.7)	223 (26.4)	451 (39.1)		176 (26.1)	57 (8.5)	218 (32.3)	
Body Mass Index(Kg/m ²)								
<18.5	30 (1.4)	12 (1.3)	18 (1.6)	0.005*	3 (10.3)	3 (10.3)	12 (41.4)	<0.001*
18.5-24.99	752 (37.6)	347 (41)	405 (35.1)		142 (18.9)	73 (9.7)	190 (25.3)	
25-29.99	828 (41.4)	351 (41.5)	477 (41.4)		196 (23.7)	89 (10.7)	192 (23.2)	
>30	390 (19.6)	137 (16.2)	253 (21.95)		100 (25.6)	29 (7.4)	124 (31.8)	
Employment								
Employed	514 (25.7)	225 (26.6)	289 (25)	0.232	116 (22.6)	225 (15.1)	259 (25.9)	0.364
Housewife	1486 (74.3)	621 (73.4)	865 (75)		325 (21.9)	155 (10.4)	385 (25.9)	
Education								
Illiterate	34 (1.7)	10 (1.2)	24 (2.1)	0.064	4 (11.8)	5 (14.7)	15 (44.1)	0.016*
Elementary	393 (19.6)	153 (19)	240 (20.8)		84 (21.4)	33 (8.45)	123 (31.3)	
Secondary	637 (31.8)	262 (30)	375 (32.5)		154 (24.2)	61 (9.6)	160 (25.1)	
University	936 (46.8)	421 (49.8)	515 (44.6)		199 (21.3)	96 (10.3)	220 (23.5)	
Obstetric characteristics								
Mode of delivery								
NVD	848 (42.4)	305 (36.1)	543 (47.1)	<0.001*	218 (25.7)	95 (11.2)	230 (27.1)	<0.001*
C/S	562 (28.1)	277 (32.7)	285 (24.7)		110 (19.6)	47 (8.4)	128 (22.8)	
both	190 (9.5)	76 (9)	114 (9.9)		48 (25.3)	13 (6.8)	53 (27.9)	
no	400 (20)	188 (22.2)	212 (18.4)		65 (16.2)	40 (10.0)	107 (26.8)	
Abortion	355 (17.8)	127 (15)	228 (19.8)	0.003*	92 (26.2)	38 (10.7)	97 (27.3)	0.038*
Neonate	220 (11)	79 (9.3)	141 (12.2)	0.024*	44 (20)	16 (7.3)	81 (36.8)	<0.001*
>4Kggg								
Twin	78 (3.9)	27 (3.2)	51 (4.4)	0.099	22 (28.2)	6 (7.7)	23 (29.5)	0.350
pregnancy								
Menstruation								
Regular	1504 (79.3)	706 (83.5)	880 (76.3)	<0.001*	220 (20.2)	160 (10.2)	400 (25.2)	<0.001*
Irregular	414 (20.7)	140 (16.5)	274 (33.7)		121 (29.2)	35 (8.5)	118 (28.5)	
No. of deliveries								
≤2	720 (45)	324 (44.3)	396 (45.6)	0.022*	173 (25.7)	55 (8.4)	168 (22.8)	0.044*
>2	880 (55)	408 (55.7)	472 (54.4)		208 (36.8)	74 (10.0)	190 (29.5)	
No. of pregnancies								
≤2	860 (45.7)	395 (45.9)	465 (54.1)	<0.001*	175 (37.6)	73 (15.7)	217 (46.6)	<0.001*
>2	1020 (54.3)	472 (46.3)	548 (53.7)		218 (39.8)	89 (16.4)	241 (43.8)	

*P<0.05 is significant; chi-squared test for categorical data

and irregular menstruation (P<0.001) were found to be significantly associated with UI (P<0.05). In the present study, the prevalence of UI increased with the age of 40 years and BMI <30 and then decreased to the age of 49 years and BMI >30 (Kg/m²). The Table shows that the prevalence of SUI increased with age and BMI; UUI decreased but MUI prevalence decreased with age (25-37years

old) and BMI (25-30) and then increased with >38 years old and BMI>30. There was no significant difference as to the education level between continent and incontinent women, but increase in the education level tends to reduce the overall number of women with MUI and increase the number of women with SUI, except in high level educated women. There was a significant relationship

between the type of UI and all the obstetric characteristics, except for twin pregnancy ($P<0.05$). To examine the contributing factors of UI, multiple logistic regression analysis was carried out and the results showed that regular menstruation was a protective factor for UI (OR=0.631, 95% CI 0.501 - 0.795, $P<0.001$) but vaginal delivery and older age were associated with the risk of developing UI after adjusting for the other variables ($P<0.05$) (Table 2).

DISCUSSION

This cross-sectional study was conducted to assess the prevalence, subtypes and obstetric risk factors of UI. The results showed that the prevalence of UI in reproductive age women attending the community health care centers of Dezful was high. Estimation of the prevalence of UI is very difficult due to differences in definition, methodology and population study.¹³ Several studies in European women estimated it to be between 14.1 and 68.8%,⁶ but in developing countries, the mean prevalence

is 28.7% (range 5.2–70.8%).⁷ The majority of these studies were clinical-based and different instruments were used to assess UI. Thus, there are limited data from community based studies²⁰ and the comparison of results is very difficult. In a research in Turkey more than one-third of women attending family health care centers had UI.²¹ In a cross-sectional study in France, 15.25% of reproductive age women referring to the general practitioners had UI.²² It was 11.6% in a community-based study in Shanghai¹ and 29.3% was reported in Turkey.²³ These differences in the prevalence of UI show the need for a unique definition and instrument to assess it.

In this study, MUI was the most common type of UI, followed by SUI. Several studies showed that urge and mixed incontinence are common in older age women,²⁴ but in the young and middle age ones, SUI is predominant.²⁵ In a clinical-based study in Iran, more than one- half of women with the complaint of UI had SUI.²⁶ In a study in Turkey, UUI was the most prevalent type of

Table 2: Factors associated with urinary incontinence using multiple logistic regression analysis

Factor	OR (95% CI)	P value
No. of pregnancies		
≤2	1.0 (ref.)	0.812
>2	1.03 (0.77 - 1.38)	
No. of deliveries		
≤2	1.0 (ref.)	0.744
>2	1.05 (0.78 - 1.41)	
Abortion	1.23 (0.85 – 1.79)	0.274
Mode of delivery		
no	1.0 (ref.)	
C/S	1.38 (0.87 – 2.12)	0.162
NVD	1.46 (1.04 – 2.05)	0.026*
C/S +NVD	0.91 (0.64 – 1.30)	0.615
Irregular Menstruation	0.63 (0.50 - 0.79)	<0.001*
Neonate>4 Kg	0.99 (0.73 – 1.37)	0.988
Age (yr)		
15-25	1.0 (ref.)	
26-37	0.62 (0.44 - 0.87)	0.006*
38-49	0.70 (0.54 - 0.90)	0.005*
BMI (Kg/ m ²)		
16-18.49	1.0 (ref.)	
18.5-24.99	1.27 (0.57 – 2.84)	0.56
25-29.99	0.82 (0.62 – 1.08)	0.154
>30	0.81 (0.63 – 1.05)	0.111

* $P<0.05$ is significant

UI in 20-80 year old women,²³ but in another research in Turkey, the most common type of UI in reproductive age women was SUI.²⁷ The results of these studies are not consistent with the present study, but in a study on young and middle age women, the most prevalent type was MUI followed by SUI and UUI.¹⁶

In the present study, the prevalence of UI increased with age of 40 years and BMI<30 and then decreased with age of 50 years and BMI>30. These trends also are not completely consistent with other epidemiologic studies which reported that the prevalence of UI increased with age and BMI.^{16,28} In the present study, the prevalence of UUI decreased, but SUI and MUI increased with increasing age. A study on women>20 yr showed that the proportion of women with UUI and MUI increased while SUI decreased with increasing age.²⁹ Although this study suggests that there is no significant relationship between the education level and UI in this age group, the prevalence of the subtypes increased with the education level. Studies showed that lower education background was associated with UI.^{1,30} Childbearing is an established risk factor for UI. Some evidence indicates that vaginal delivery might predispose women to UI and SUI more than C/S.^{1,16} In this study, there was a significant association between the number of pregnancies, deliveries and mode of delivery with UI and its subtypes, and MUI was more prevalent in NVD, C/S deliveries, women who had delivered both vaginally and by C/S and those who had not delivered. Results showed that in the group with both types of delivery, the prevalence of MUI and SUI, respectively, was higher than the C/S group. A study showed that SUI and UUI increased with the number of pregnancies and vaginal deliveries, while increases in the number of cesarean sections affected neither SUI nor UUI.³¹ Pregnant women are exposed to a greater amount of reproductive hormones, especially relaxin that can induce UI due to the relaxation of connective tissue.³² This study strongly suggests that abortion is a risk factor for UI

and has been reported in some studies.³³ In the present study, among women who had abortion, MUI was more prevalent but a study showed that the rate of SI was higher in this group.³¹ Relaxin typically peaks in the first trimester of pregnancy³³ and the effects of abortion on UI may be due to increase in relaxin concentrations. A study showed that the prevalence of UI was associated with the birth weight of neonates.³⁴ In addition to the extra weight borne in the abdominal and pelvic organs of pregnant women with the large fetus, this effect could be due to the size of the neonate that has passed through the delivery canal.³⁵ In this study, birth weight >4 kg had a significant relationship to UI and MUI was more prevalent in this group. In the present study, there was no association between twin pregnancy, UI and its subtypes; also, irregular menstrual period was also a significant risk factor for UI. This is consistent with the results of a study conducted in China.³⁰

Several limitations of the present study should be considered. The majority of the women who participated in this study were married. In this study, UI was self-reported and diagnosis was based on the responses to the ICIQ-SF questionnaire. This study was carried out in community health care centers and the research team suggests that other studies be performed in community dwelling women on a door to door manner for better generalization of the results to the general community. The strength of this study was the participation of a large number of women in a specific age group which provides an opportunity to analyze the prevalence and determinants of different types of urinary incontinence separately, using standard methods for recording the symptoms.

CONCLUSION

This study revealed that UI symptoms were very frequent in reproductive age women attending health care centers in Dezful and MUI was more prevalent in comparison to the other types of UI. Although the results of this study

cannot be generalized to the general population, the present study confirms previous studies on wider age ranges that showed the effect of aging, mode of delivery and irregular menstruation with development of UI. Results also showed that there was a need for more population-based studies in Iran to better estimate the UI prevalence with a unique and standard instrument and also to better ascertain the risk factors of UI.

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REFERENCES

- Liu B, Wang L, Huang SS, et al. Prevalence and risk factors of urinary incontinence among Chinese women in Shanghai. *Int J Clin Exp Med*. 2014;7:686-96.
- Danforth KN, Townsend MK, Lifford K, et al. Risk factors for urinary incontinence among middle-aged women. *Am J Obstet Gynecol*. 2006;194:339-45.
- Tannenbaum C, Corcos J, Assalian P. The relationship between sexual activity and urinary incontinence in older women. *J Am Geriatr Soc*. 2006;54:1220-4.
- Vigod SN, Stewart DE. Major depression in female urinary incontinence. *Psychosomatics*. 2006;47:147-51.
- Wilson L, Brown JS, Shin GP, et al. Annual direct cost of urinary incontinence. *Obstet Gynecol*. 2001;98:398-406.
- Cerruto MA, D'Elia C, Aloisi A, et al. Prevalence, incidence and obstetric factors' impact on female urinary incontinence in Europe: a systematic review. *Urol Int*. 2013;90:1-9.
- Walker GJA, Gunasekera P. Pelvic organ prolapse and incontinence in developing countries: review of prevalence and risk factors. *Int Urogynecol J*. 2011;22:127-35.
- Jokhio AH, Rizvi RM, Rizvi J, Macarthur C. Urinary incontinence in women in rural Pakistan: prevalence, severity, associated factors and impact on life. *BJOG*. 2013;120:180-6.
- Kirss F, Lang K, Toompere K, Veerus P. Prevalence and risk factors of urinary incontinence among Estonian postmenopausal women. *Springerplus*. 2013;2:524.
- Hunnskaar S, Arnold EP, Burgio K, et al. Epidemiology and natural history of urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct urology*. 2000;11:301.
- Ahmadi B, Alimohammadian M, Golestan B. The hidden epidemic of urinary incontinence in women: a population-based study with emphasis on preventive strategies. *International Urogynecological Journal*. 2010;21:453-9.
- Hajebrahimi S, Azaripour A, Sadeghi-Bazargani H. Clinical and transperineal ultrasound findings in females with stress urinary incontinence versus normal controls. *Pak J Biol Sci*. 2009;12:1434-7.
- Buckley BS, Lapitan MC. Epidemiology Committee of the Fourth International Consultation on Incontinence, Paris, 2008. Prevalence of urinary incontinence in men, women, and children--current evidence: findings of the Fourth International Consultation on Incontinence. *Urology*. 2010;76:265-70.
- Bedretdinova D, Fritel X, Panjo H, Ringa V. Prevalence of Female Urinary Incontinence in the General Population According to Different Definitions and Study Designs. *Eur Urol*. 2016;69:256-64.
- Aggazzotti G, Pesce F, Grassi D, et al. Prevalence of urinary incontinence among institutionalized patients: a cross-sectional epidemiologic study in a mid-sized city in northern Italy. *Urology*. 2000;56:245-9.
- Peyrat L, Haillet O, Bruyere F, et al.

- Prevalence and risk factors of urinary incontinence in young and middle-aged women. *BJU Int.* 2002;89:61-6.
- 17 Hajebrahimi S, Nourizadeh D, Hamedani R, Pezeshki MZ. Validity and reliability of the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form and its correlation with urodynamic findings. *Urol J.* 2012;9:685-90.
 - 18 Avery K, Donovan J, Peters TJ, et al. ICIQ: A brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn.* 2004;23:322-30.
 - 19 Klovning A, Avery K, Sandvik H, Hunnskaar S. Comparison of two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the incontinence severity index. *Neurourol Urodyn.* 2009;28:411-5.
 - 20 Minassian VA, Devore E, Hagan K, Grodstein F. Severity of urinary incontinence and effect on quality of life in women by incontinence type. *Obstet Gynecol.* 2013;121:1083-90.
 - 21 Kılıç M. Incidence and risk factors of urinary incontinence in women visiting family health centers. *Springerplus.* 2016;5:1331.
 - 22 Lasserre A, Pelat C, Guérault V, et al. Urinary Incontinence in French Women: Prevalence, Risk Factors, and Impact on Quality of Life. *Eur Urol.* 2009;56:177-83.
 - 23 Sensoy N, Dogan N, Ozek B, Karaaslan L. Urinary incontinence in women: prevalence rates, risk factors and impact on quality of life. *Pak J Med Sci.* 2013;29:818-22.
 - 24 Nuotio M, Jylhä M, Luukkaala T, Tammela TL. Urinary incontinence in a Finnish population aged 70 and over. Prevalence of types, associated factors and self-reported treatments. *Scand J Prim Health Care.* 2003;21:182-7.
 - 25 Hannestad YS, Rortveit G, Sandvik H, Hunnskaar S. A community-based epidemiological survey of female urinary incontinence: the Norwegian EPINCONT study. *Epidemiology of Incontinence in the County of Nord-Trøndelag. J Clin Epidemiol.* 2000;53:1150-7.
 - 26 Momenimovahed Z, Pakgohar M, Montazeri A. Factors Contributing to the Severity of Urinary Incontinence and Its Association with Sexual Function: A Cross Sectional Study. *International Journal of Nursing Science.* 2014;4:17-21.
 - 27 Akkoca AN, Kurt R, Özdemir ZT, et al. The prevalence of urinary incontinence, sexual function and quality of life in women of reproductive age admitted to urogynecology departments. *Acta Medica Mediterranea.* 2014;30:1059.
 - 28 Goldberg RP, Kwon C, Gandhi S, et al. Urinary incontinence among mothers of multiples: the protective effect of cesarean delivery. *Am J Obstet Gynecol.* 2003;188:1447-50; discussion 1450-3.
 - 29 Simeonova Z, Milsom I, Kullendorff AM, et al. The prevalence of urinary incontinence and its influence on the quality of life in women from an urban Swedish population. *Acta Obstet Gynecol Scand.* 1999;78:546-51.
 - 30 Ge J, Yang P, Zhang Y, et al. Prevalence and risk factors of urinary incontinence in Chinese women: a population-based study. *Asia Pac J Public Health.* 2015;27:NP1118-31
 - 31 Tincello DG, Teare J, Fraser WD. Second trimester concentration of relaxin and pregnancy related incontinence. *Eur J Obstet Gynecol Reprod Biol.* 2003;106:237-8.
 - 32 Song YF, Lin J, Li YQ, et al. Analysis of risk factors about stress urinary incontinence in female. *Zhonghua Fu Chan Ke Za Zhi.* 2003;38:737-40.
 - 33 Emmi AM, Skurnick J, Goldsmith LT, et al. Ovarian control of pituitary hormone secretion in early human pregnancy. *J Clin Endocrinol Metab.* 1991;72:1359-63.
 - 34 Eftekhari T, Hajibaratali B, Ramezanzadeh F, Shariat M. Postpartum evaluation of stress urinary incontinence among

- primiparas. *Int J Gynaecol Obstet.* 2006;94:114-8.
- 35 Barbosa AM, Marini G, Piculo F, et al. Prevalence of urinary incontinence and pelvic floor muscle dysfunction in primiparae two years after cesarean section: cross-sectional study. *Sao Paulo Med J.* 2013;131:95-9.