URINARY INCONTINENCE AMONG PREGNANT WOMEN FOLLOWING ANTENATAL CARE IN PUBLIC HOSPITALS OF ADDIS ABABA, ETHIOPIA

Getu Kassaye, MD[1], Eskinder Kebede, MD, FRM, FMIS[2]

ABSTRACT

INTRODUCTION: Urinary incontinence (UI) is a common but under-reported problem among women. Information on the prevalence and health burden of UI in Ethiopia is unknown. This study aimed to establish the prevalence of urinary incontinence and its determinants among pregnant women in Addis Ababa, Ethiopia.

METHODS: A facility-based cross-sectional study was used and the data was collected from June to July 2016 using the International Consultation on Incontinence Criteria through an exit interview. Three hundred thirty three consenting pregnant women aged 15 to 42 years attending antenatal care (ANC) at tertiary hospitals in Addis Ababa, Ethiopia were interviewed. Data were entered and cleaned using Epi Info and analyzed using SPSS version 20.0 statistical software. Initially, univariate and bivariate analysis were used followed by multivariate logistic regression on socio-demographic, comorbidities, mode of deliveries, and parity.

RESULTS: The prevalence of urinary incontinence was 24.6% (n=82) among the pregnant women. Thirty-eight (11.4%) participants had reported stress urinary incontinence (SUI) and 15 (4.5%) urge urinary incontinence (UUI), while 29(8.7%) had mixed incontinence (MUI) during the preceding month of the interview. Seven women (8%) had moderate to severe symptoms. Of the 82 patients with incontinence, 18(21.9%) consulted a healthcare professional: 9(23.7%) of the women who consulted had SUI, while 3(20%) and 6(20.7%) of them had UUI and MUI, respectively. Higher proportion of women with severity symptoms sought treatment: 83% of the treatment seekers had weekly or daily leaking whereas75% of non-treatment seekers leaked similar frequency. The most common reason for not seeking help was that urinary leakage was considered to be normal and common during pregnancy. Pregnant women who delivered by cesarean section had lower odds of having urinary incontinence (AOR: 0.46; 95% CI: 0.22, 0.98) than those women who delivered vaginally.

CONCLUSIONS: The prevalence of urinary incontinence during pregnancy in our facility based study is as common as reported in other parts of the world. Incorporating information on incontinence symptoms (especially for those delivered vaginal) needs to be considered.

KEY WORDS: Lower urinary tract symptoms, urinary incontinence, pregnancy, ICI-Questionnaire, Ethiopia

(The Ethiopian Journal of Reproductive Health; 2020; 12;41-50)

1 Department of Obstetrics and Gynecology, School of Medicine, CHS, Wolaita University, Wolaita, Ethiopia

2 Department of Obstetrics and Gynecology, School of Medicine, CHS, Addis Ababa University, Addis Ababa, Ethiopia

INTRODUCTION

Urinary incontinence (UI) is a common but under-reported problem among women globally, with a reported prevalence in pregnancy of 32%-64% among all women[1]. Data from a large number of cross-sectional and cohort studies indicate that UI in women is highly prevalent during pregnancy. More than 50% of all pregnant women experience UI when running, jumping, coughing, or laughing. Stress UI is the most common symptom of UI in association with pregnancy[1]. Wide range of prevalence is reported mainly due to varied definitions of incontinence, study design (i.e., selection bias), the dropout/refusal rate, and the method of data collection[2].

In 2002, the International Continence Society (ICS), in its efforts to clarify and unify the language used in studies of lower urinary tract complaints, updated the nomenclature used with lower urinary tract dysfunction. This has made epidemiological studies easier and facilitated the comparison and pooling of studies carried out in different settings. According to this update, lower urinary tract dysfunctions could be considered a symptom, a sign, a urodynamic finding, or as a condition.[3]

Pregnancy is one of the main risk factors for the development of SUI in young women[4]. The effect of pregnancy on lower urinary symptoms in women has for a long time been of interest to researchers. The anatomical and physiological changes affecting the lower urinary tract in pregnancy as well as the hormonal milieu of pregnancy have been postulated to underlie the pathogenesis of lower urinary symptoms in pregnancy[5, 6]. Elevated levels of estrogen and progesterone are known to make the bladder more squamous. The detrusor muscle undergoes hypertrophy and hypotonic with increased bladder capacity[7]. The bladder also undergoes anatomical changes favorable to lower urinary tract symptoms. Several studies have linked these anatomical changes to pregnancy with lower urinary tract symptoms. In a study of 123 pregnant women, the mean daily urine output and the mean number of voids per day increased with gestational age and declined after delivery, while episodes of urinary incontinence peaked in the third trimester of pregnancy and improved after birth[5, 8-10].

The characterization of UI occurs according to the events that lead to the loss of urine, being classified as stress UI (urine leakage simultaneous with effort, physical exercise, coughing or sneezing), urge UI (involuntary loss of urine accompanied or immediately preceded by a sudden and uncontrollable urge to urinate that is difficult to postpone) or mixed (when there are signs and symptoms of the two types reported above[1, 11-14]. UI negatively affects the quality of life due to feelings of embarrassment, fear of odor, and distress leading women to distance themselves from social and recreational activities.[17]

This study aimed to study the prevalence of urinary symptoms in women who had access to ANC services and identified the level of help-seeking for urinary symptoms in this population. The study identified the characteristics of incontinence in terms of the prevalence of different types of incontinence, factors contributing to urinary incontinence.

METHOD

This is a facility-based cross-sectional descriptive study that was conducted at two teaching hospitals Tikur Anbessa Specialized Hospital and Gandhi Memorial Hospital in Addis Ababa, Ethiopia. The study population was pregnant women who had ANC follow-up at these two hospitals. Pregnant women who were competent to give informed consent and willing to participate were included in the study. The exclusion criterion was pregnant women who were severely sick, in labor or unable to give consent, and known to have mental retardation, spinal cord injuries, or psychiatric patients and subjects previously diagnosed to have obstetric fistulas.

A single population proportion formula was used to calculate the sample size using the prevalence of UI in pregnancy as 27% (P=0.27), level of significance was 5%, Z=confidence level at 95% and absolute precision or margin of error was 5% (α=0.05).

Data were collected from 333 pregnant women from June to July 2016. Face-to-face interviews were conducted using a structured questionnaire, ICIQ-UI Short Form UK,

which was developed by an ICI-Questionnaire Advisory Board. This questionnaire has proven its validity and reliability and has been published as per the standard of the International Consultation on Incontinence, which was taken for this research to address questions related to urinary symptoms. Its English version was translated into Amharic (national language) and back translation to check for consistency[18].

The study participants were interviewed at the exit after completing their clinic visit. The data were collected by four midwives. Training was given to data collectors on the objective of the study, confidentiality of information, and techniques of the interview. The principal investigator supervised the data collection activity. Questionnaires were pre-tested before the start of the actual study.

Data entry and cleaning using statistical software for epidemiology EPI-Info version 3.5.4 was made and exported to SPSS statistics version 20 for analysis. Univariate and bivariate analyses such as proportions, percentages, ratios, frequency distributions, appropriate, descriptive statistics were used to describe the study findings. Summary tables were used to describe the data to assist data presentation. Results were presented as odds ratio (OR), adjusted OR (aOR), 95% CI, and probability value and are shown in the effect plots. Statistical significance was set at P<.05.

Ethical clearance was obtained from the Research and Publication Committee of the Department of Gynecology and Obstetrics of the College of Health Sciences, Addis Ababa University. Permission was obtained from the hospital medical director and department of gynecology and obstetrics. Participation in the study was completely voluntary and informed consent was acquired from every woman before participation. The study did not involve vulnerable populations.

RESULTS

A total of 333 eligible pregnant women participated in the present study. The age range of participants was 15-42 years. The mean age of respondents was 28.2(+4.3SD). The majority, 294(88.3%), were from Addis Ababa and 39(11.7%) from outside the city.

Three hundred nine (92.8%) women were married, and two-thirds of the participants 208(62.5%) were orthodox Christians. The majority 153(45.9%) of the participants were from the Amhara ethnic group. Two hundred twenty (66%) mothers attended at least high school and the rest attended elementary school or less. Regarding the occupational status of the mothers, 163(48.9%) were housewives and 138(44.4%) were employed.

In this study, a total of sixty-five (19.5%) pregnant women were found to have currently had a medical illness, of which 31(32.3%) had hypertension, 10(15.4%) were diabetics, 9(13.9%) were cardiac patients. Two cases of asthma and two cases of epilepsy were found.

Of the three hundred thirty-three pregnant women, 327(98.2%) were third-trimester pregnancies; the mean GA was 35.5WKS (4.1SD) and the ranges were between 27 and 42 weeks of GA.

Among all the respondents, 152(45.6%) were nulliparous, 101(30.3%) were Para one, 77(23.1%) were Para two, and above, only three cases of Para five were found (Table 1).

Of the total interviewed, 82(24.6%) reported urinary incontinence. Thirty-eight (11.4%) reported stress urinary incontinence, 15(4.5%) reported urge incontinence and 29(8.7%) reported mixed incontinence during the preceding month (of whom 8% had moderate or severe symptoms). The percentage was higher for those with UI living outside the city 33.3% when compared to 23.5% who lived in. There were a total of 65 cases out of 333 interviewees had a medical illness. Of these, there were 22 cases reported having UI, which was 33.8% of women with illness but contributed only 6.6% to the total. Of the 333 women, 152 were nulliparous and 29(19.1%) had UI, 181 were multiparous and 53(29.3%) had UI. 120 of participants had a previous vaginal delivery; of these, 41(34.2%) had UI, 61 cases reported having an only cesarean delivery and of those, 12(19.7%) had UI (Table 1).

Of the 82 women with UI, only 18(21.9%) sought professional help. Of these, 9(23.7%) women with SUI, 3(20%) with UUI, and 6(20.7%) with MUI had sought help for urinary symptoms. The most common reasons for seeking help were that they feared that the problem

would worsen and that they accepted the problem as a medical illness.

The prevalence of help-seeking remained low. Approximately one-third or less of the women in the different symptom groups had sought help. Besides, many patients with relatively severe symptoms still do not seek help for urinary incontinence. An overall of about 70% of those with moderate or severe urinary incontinence and nearly two-thirds (64%) of those with daily episodes of urinary incontinence do not seek help. We also found that 52.4%(43 cases) of pregnant women in this study thought that leakage of urine was part of the normal pregnancy process, and as a result, did not seek medical help.

Table 1: Distribution of pregnant women by factors associated with urinary incontinence in Tikur Anbessa & Gandhi hospitals in Addis Ababa, ETHIOPIA, 2016.

Characteristics (N333)	(n)	Yes	Yes %	No	No %	Total %
Age						
15-24	63	10	15.9	53	84.1	18.9
25-34	238	65	27.3	173	72.7	71.5
35-44	32	7	21.9	25	78.1	9.6
Total	333	82	24.6	251	75.4	100.0
Address						
Addis Ababa	294	69	23.5	225	76.5	88.3
Out of Addis Ababa	39	13	33.3	26	66.7	11.7
Total	333	82	24.6	251	75.4	100.0
Education level						
Tertiary education	79	20	25.3	59	74.7	23.7
High school	141	36	25.5	105	74.5	42.3
Primary education	83	23	27.7	60	72.3	24.9
Able to read and write	14	1	7.1	13	92.9	4.2
Unable to read and write	16	2	12.5	14	87.5	4.8
Total	333	82	24.6	251	75.4	100.0
Marital Status						
Married	309	77	24.9	232	75.1	92.8
Others	24	5	20.8	19	79.2	7.2
Total	333	82	24.6	251	75.4	100.0
Medical illness						
Yes	65	22	33.8	43	66.2	19.5
No	268	60	22.4	208	77.6	80.5
Total	333	82	24.6	251	75.4	100.0
Parity of Women						
Nullparus	152	29	19.1	123	80.9	45.6
Multiparus	181	53	29.3	128	70.7	54.4
Total	333	82	24.6	251	75.4	100.0
Mode of Delivery						
Ever had vaginal delivery	120	41	34.2	79	65.8	36.0
CS only	61	12	19.7	49	80.3	18.3
No delivery	152	29	19.1	277	182.2	45.6
Total	333	82	24.6	251	75.4	100.0

Figure 1 shows the prevalence of urinary incontinence among pregnant women out of 333 respondents, 82(24.6%) reported urinary incontinence, of which 38(11.4%) had SUI, 29(8.7%) had MUI, 15, and (4.5%) had UUI.

Analyzing the associated factors for UI, multiparous women were found to have 1.76(95% CI:1.05-2.94) with higher odds of having urinary incontinence than those nulliparous. Regarding the mode of delivery, the pregnant women who had vaginal delivery had a 2.12: 95%CI(1.02;4.42) odds of urinary incontinence than those who delivered with cesarean section.**(Table2)**

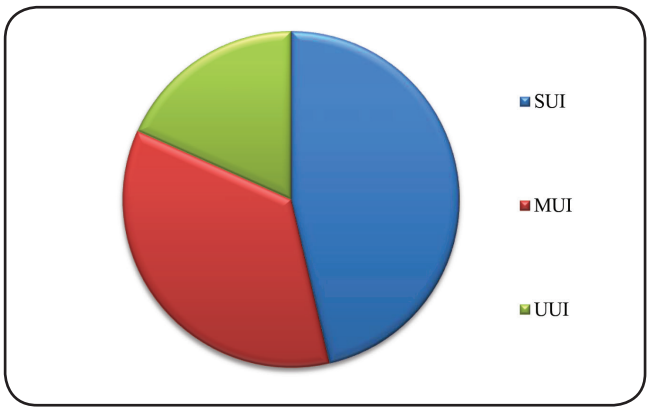

Figure 1: Prevalence (%) of types of UI among pregnant women (n=333)

Table 2. Binary regressions with factors associated with urinary incontinence among pregnant women in Tikur Anbessa & Gandhi hospitals in Addis Ababa, ETHIOPIA, 2016

Urinary incontinence Characteristics (n=333)	Yes N (%)	No N (%)	COR(95%CI)
Age			
15-24	10(15.9)	53 (84.1)	0.67(0.23, 1.98)
25-34	65(27.3)	173(72.7)	1.34(0.55, 3.25)
35-44	7(21.9)	25(78.1)	1.00
Address			
Addis Ababa	69(23.5)	225(76.5)	0.61(0.30, 1.26)
Out of Addis Ababa	13(33.3)	26(66.7)	1.00
Education level			
Tertiary education	20(25.3	59(74.7)	2.37(0.50, 11.36)
High School	36(25.5)	105(74.5)	2.40(0.52, 11.08)
Primary education	23(27.7)	60(72.3)	2.68(0.57, 12.74)
Able to read and write	1(7.1)	13(92.9)	0.54(0.43, 6.67)
Unable to read and write	2(12.5)	14(87.5)	1.00
Marital Status			
Married	77(24.9)	232(75.1)	1.00
Others	5(20.8)	19(79.2)	0.79(0.27, 2.20)
Medical illness			
Yes	22(33.8)	43(66.2)	1.00.00
No	60(22.4)	208(77.6)	0.56(0.31, 1.02)
Parity of Women			
Nulliparus	29(19.1)	123(80.9)	1.00
Multiparus	53(29.4)	128(70.6)	0.032 P. value 1.76(1.05, 2.94)*
Mode of Delivery			
Ever had vaginal delivery	41(34.2)	79(65.8)	0.045 P. value 2.12 (1.02, 4.42)*
CS only	12(19.7)	49(80.3)	1.00

* Statistical significance at a significance level of 0.05.

To adjust for possible confounders, those variables with a cutoff value of p<0.5 in binary logistic regression (parity, mode of delivery, marital status, and address) were further analyzed in multivariate logistic regressions. Women having vaginal delivery were more likely to have urinary incontinence than those who delivered with cesarean section AOR:0.46:95% CI(0.22,0.98). **(Table3)**

Table3: Multivariable logistic regression analysis of factors associated with urinary incontinence among pregnant women in Tikur Anbessa & Gandhi hospitals in Addis Ababa, ETHIOPIA, 2016 (n=333)

Urinary incontinence Characteristics (n=333)	Yes N (%)	No N (%)	COR(95%CI)	AOR (95%CI)
Marital Status				
Married	77(24.9)	232(75.1)	1.00	
Others	5(20.8)	19(79.2)	0.79(0.27, 2.20)	0.00(00,-)
Medical illness				
Yes	22(33.8)	43(66.2)	1.00	1.00
No	60(22.4)	208(77.6)	0.56(0.31, 1.02)	0.49 (0.22, 1.10)
Parity of Women				
Nullparus	29(19.1)	123(80.9)	0.57(0.34, 0.95)*	0.00(0.00, -)
Multiparus	53(29.3)	128(70.7)	1.00	
Mode of Delivery				
Ever had vaginal delivery	41 (34.2)	79(65.8)	1.00	1.00
CS only	12(19.7)	49(80.3)	0.47(0.23, 0.99)	0.46(0.22, 0.98) **

** Statistically significant at a significance level of 0.05

Of the 82 women with UI, only 18(21.9%) sought professional help. The most common reasons for seeking help were that they did not want the problem to worsen and consider the problem as a medical illness

DISCUSSIONS

This study showed a prevalence of only a quarter (24.6%) with urinary incontinence during pregnancy with access to ANC care services. The majority of patients had stress symptoms either alone (11.4%) or in combination with urge symptoms (8.7%). This result is higher than that of a study done at the University of Gondar Hospital, North West Ethiopia, which showed a prevalence of 11.4% UI among pregnant women, following antenatal care,[19] and is comparable to the study conducted by Zaria, Nigeria, which showed the prevalence rate of all types of urinary incontinence during pregnancy of 21.1%, with stress UI being responsible for more than half of the cases of incontinence reported[20]. This is similar to studies done in India, 21.8%[21], and in Ladysmith, KwaZulu-Natal, South Africa, 35.4%.[11]

A study on the prevalence of urinary incontinence in pregnant women among a multi-ethnic population resident in Norway showed a similar finding of prevalence rates of UI at 28 weeks of gestation was 26% for women of African origin, 36% for women of Middle Eastern origin, 40% for women of East Asian origin, 43% for women of South Asian origin and 45% for women of European/North American origin.[22]

The study finding is lower in studies that were carried out in North America, where the prevalence was reported to be 52%.[23] In Europe, the prevalence of UI ranged from 14.1 to 68.8% and increased with increasing age.[23] The wide range of reports maybe because the prevalence of UI in pregnancy depends on risk factors: maternal age ≥35 years and initial body mass index, a family history of UI and parity, and race. Black women are at less risk of having a UI than Hispanic and white women[24]. A study that compared the prevalence of urinary incontinence by type of race found out that prevalence of incontinence

was highest among Hispanic women, followed by white, black, and Asian-American women (36%, 30%, 25%, and 19%, respectively, p>0.001).[25]

The definition of incontinence varies between studies. Those using definitions of any incontinence reported a prevalence to be 25% or more, whereas those using more severe definitions reported lower prevalence.[26] However, it was expected that the prevalence rate in this population would be higher than that in a more general community sample, as the study sample focuses on pregnant women accessing tertiary care, some of whom are likely to have additional comorbidities by being attendees in tertiary care. /The distribution of types of symptoms also varies across studies, but it is a fairly consistent finding that SUI is the most common type of symptom, followed by MUI. The percentage of urinary incontinence by type found in this study was 46.3% for SUI, 35.4% for MUI, and 18.3% for UUI. This is similar to the Gondar study which showed The proportion of stress UI was 58%, mixed UI 24.5%, and urgency UI 12.5%.[19]

The questionnaire used in this study had eight items identifying SUI compared with one item to measure UUI. Therefore, there is more opportunity to identify women with SUI, which may have exaggerated the differential in these proportions to a certain extent.

In this study, a significant association was found between having previous vaginal delivery were two-fold more likely to have UI than women with previous cesarean section delivery. Moreover, those multiparas were more likely to have a UI compared to the nulliparous population. This is not a new finding compared with previous studies.[27-29]

Although they were not significant in the present study, it was observed an increased prevalence of UI in those with medical illnesses. We also observed that current UI prevalence increases with age, less education, location, medical illness, diabetes, and hypertensive women; this is similar to studies conducted in other settings.[27-29]

Many patients with relatively severe symptoms still do not seek help for urinary incontinence. Overall, about 70% of those with moderate or severe urinary incontinence and nearly two-thirds (64%) of those with daily episodes of urinary incontinence do not seek help. Factors that might explain this difference may include the degree to which health care professionals screen for different types of urinary incontinence and the range and type of treatment options available to urinary incontinence sufferers, awareness of which may prompt consulting a health care professional.

This is similar to the French study, which found that a large majority of women with UI(60.3%) had never reported their symptoms to a physician[30].

In another study done in four European countries to see help-seeking behavior, about a quarter of women with urinary incontinence (Spain(24%), the UK(25%), France(33%) and Germany (40%)), consulted a doctor about it.[31]

Comparable to the study done in KwaZulu-Natal in South Africa, that reported help-seeking behavior for around 25.7% of incontinent women. The most common reason for seeking help was that the problem was getting worse.[11]

This study also showed factors determining patient treatment-seeking behavior. Treatment seeking was related to the type of urinary incontinence. While 40% of those with moderate or severe UUI seek help (based on self-reported severity), only 12.5% of those with moderate to severe SUI do so.

This finding is in agreement with the French study that found overall, a negative impact of UI using the highest mean ICIQ-SF score was reported for women with mixed UI whereas, urge UI and stress UI seem to have equivalent effects, and only mixed UI has a larger impact on the quality of life.[30]

This demonstrates that although the present sample was accessing ANC care services, they were no more likely to consult about their symptoms than a general population sample. It can be assumed, therefore, that there are high levels of unmet needs in women with UI.

CONCLUSION

The prevalence of urinary Incontinence was 24.6%. The majority of 11.4% reported stress urinary incontinence only, 4.5% reported urge incontinence only and 8.7% reported mixed incontinence during the preceding

month. Eight percent had moderate or severe symptoms. Women with previous vaginal delivery were two-fold more likely to have UI than those with previous cesarean section delivery. Multiparous women were found to have 1.76 at higher odds of having urinary incontinence than that nulliparous.

Hence, the protective effect of CS in women after birth also persists and should, therefore, contribute to maintaining continence and postponing the onset of UI.

There was poor treatment-seeking behavior; only 21.9% of pregnant women with UI sought help. About 70% of those with moderate or severe urinary incontinence and nearly two-thirds (64%) of those with daily episodes of urinary incontinence do not seek help.

Although this occurrence is low when compared to other settings, patient treatment-seeking behavior is so low that it is worthwhile to invest in creating awareness about its occurrence and enhancing the competency of providers to recognize these symptoms, counsel, and offer treatments.

LIMITATIONS AND STRENGTHS OF THE STUDY

The reliance on self-report of UI rather than objective assessments could be some of the limitations of this study, which might have led to under-reporting of UI.

ACKNOWLEDGMENT

We would like to extend our acknowledgment to the data collectors, supervisors, and study participants. Our special thanks go to all staff in selected hospitals, especially GMH OPD nurses and medical directors.

FUNDING

None

COMPETING INTEREST

All authors declare that they have no competing interests.

AUTHORS AND THEIR CONTRIBUTIONS

GK designed and implemented the study. This included seeking IRB approval, collecting data, performing data analysis, and cleaning data. EK reviewed the reference articles and wrote the final manuscript.

CORRESPONDING AUTHOR:

Eskinder Kebede

Department of Obstetrics and Gynecology, School of Medicine, CHS, Addis Ababa University, Addis Ababa, Ethiopia

Email: eskinderkebede@yahoo.com

REFERENCES

Uncategorized References

1. Stian Langeland Wesnes SHaG. Epidemiology of Urinary Incontinence in Pregnancy and Postpartum. Department of Public Health and Primary Health Care Department of Public Health and Primary Health Care.
2. Botlero R UD, Davis SR, Bell RJ. Prevalence and incidence of urinary incontinence in women: a review of the literature and investigation of methodological issues. Int J Urol 2008;15: 230-4.
3. Abrams P CL, Fall M, Derek Griffiths Rosier P, Ulmsten U, van Kerrebroeck P, Victor A, Wein A, Standardisation Sub-committee of the International Continence Society. The standardization of terminology of lower urinary tract function: a report from the Standardisation Sub-committee of the International Continence Society. Neurourology and Urodynamics. 2002; 21(2):167-178.
4. McKinnie V SS, Wang W, et al. The effect of pregnancy and mode of delivery on the prevalence of urinary and fecal incontinence. Am J Obstet Gynecol 2005;193:512-8.
5. Adaji SE1 SO, Bature SB, Nasir S, Olatunji O. Bothersome lower urinary symptoms during pregnancy: a preliminary study using the International Consultation on Incontinence Questionnaire. Afr Health Sci 2011; Suppl 1:S46-52.
6. Stian Langeland Wesnes* SH, Kari Bo, and Guri Rortveit. Urinary Incontinence and Weight Change During Pregnancy and Postpartum: A Cohort Study. American Journal of Epidemiology 2010; Vol. 172, No. 9.
7. Fitzgerald MP GS. Anatomical and functional changes of the lower urinary tract during pregnancy. Urologic Clinics of North America. 2007;34:7–12.
8. Al-Hayek SA, P. Women's lower urinary tract function and dysfunction: definitions and epidemiology. Minerva Ginecol. 2004;56(4):311-25.
9. Malpas P JT, Lister UM. Displacement of the bladder and urethra in late pregnancy. J Obstet Br Emp. 1949;1949;56:949–960.
10. Mikhail MS, Anyaegbunam A. Lower urinary tract dysfunction in pregnancy: a review. Obstet Gynecol Surv. 1995;50(9):675-83.
11. J P Madombwe SK. High prevalence of urinary incontinence and poor knowledge of pelvic floor exercises among women in Ladysmith. School of Family Medicine and Public Health, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban. SAJOG. February;2010, Vol. 16, No. 1.
12. Abrams P CL, Fall M, Griffiths D, Rosier P, Ulmstein U. The standardization of terminology of lower urinary tract function; a report from the standardization sub-committee of the international continence society. NeurourolUrodyn. 2002;21:167–178.
13. UpToDate. Guidelines for Adult Urinary Incontinence Collaborative Consensus Document for the Canadian Urological Association. 2012.
14. 3rd International Consultation on Incontinence: Recommendations of the international scientific committee. ICI. 2005;V 1, Page 1589-1630.
15. Kjeld Leisgard Rasmussen SrK, Lars-Eric Johansson, Hans Jorgen Hynding Knudsen, And Anders Ole Agger. Obesity as a predictor of postpartum urinary symptoms. Acta Obstet Gynecol Scand. 1997;76: 359-362.
16. M Fynes VSD, P R O'Connell, C O'Herlihy. Cesarean Delivery and Anal Sphincter Injury. Obstet Gynecol. 1998;496-500.
17. Amy J. Sinclair INR. The psychosocial impact of urinary incontinence in women. Obstet Gynaecol. 2011;13 (3) 143-148.
18. P Abrams e. Fourth International Consultation on Incontinence Recommendations of the International Scientific Committee: Evaluation and Treatment of Urinary Incontinence, Pelvic Organ Prolapse, and Fecal Incontinence. Neurourol Urodyn 2010;29(1):213-40.
19. Bekele AA, Mulat Demeke, Senait. Urinary incontinence among pregnant women, following antenatal care at the University of Gondar Hospital, North West Ethiopia. BMC Pregnancy and Childbirth. 2016;16(1):333.
20. Adaji SE, Shittu OS, Bature SB, Nasir S, Olatunji O. Suffering in silence: pregnant women's experience of urinary incontinence in Zaria, Nigeria. Eur J Obstet Gynecol Reprod Biol. 2010;150(1):19-23.
21. Singh U, Agarwal P, Verma ML, Dalela D, Singh N, Shankhwar P. Prevalence and risk factors of urinary incontinence in Indian women: A hospital-based survey. Indian J Urol. 2013;29(1):31-6.
22. Bø KPØ, G.Sletner, L. Mørkrid, K. Jenum, A. K. The prevalence of urinary incontinence in pregnancy among a multi-ethnic population resident in Norway. Bjog. 2012;119(11):1354-60.
23. Jean-Michel M, Kroes J, Marroquin GA, Chau EM-S, Salafia CM, Mikhail M. Urinary Incontinence in Pregnant Young Women and Adolescents: An Unrecognized At-Risk Group. Female Pelvic Medicine & Reconstructive Surgery. 2018;24(3):232-6.
24. Muleta M: Obstetric fistula: a retrospective study of 1210 cases at the Addis Ababa Fistula Hospital. J Obstet Gynaecol 1997 -.
25. Thom DH, van den Eeden SK, Ragins AI, Wassel-Fyr C, Vittinghof E, Subak LL, et al. Differences in prevalence of urinary incontinence by race/ethnicity. J Urol. 2006;175(1):259-64.

26. Almousa S, Bandin van Loon A. The prevalence of urinary incontinence in nulliparous adolescent and middle-aged women and the associated risk factors: A systematic review. Maturitas. 2018;107:78-83.
27. Mommsen AFS. Prevalence of Urinary Incontinence as a correlate of pregnancy, vaginal childbirth, and obstetric techniques. American Journal of Public Health 1996; Vol.89. page 209-212.
28. Ojengbede M. Prevalence and the associated trigger factors of urinary incontinence among 5000 black women in sub-Saharan Africa: findings from a community survey. BJU Int. 2011.
29. Yang X, Zhang HX, Yu HY, Gao XL, Yang HX, Dong Y. The prevalence of fecal incontinence and urinary incontinence in primiparous postpartum Chinese women. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2010;152(2):214-7.
30. Lasserre A, Pelat C, Gueroult V, Hanslik T, Chartier-Kastler E, Blanchon T, et al. Urinary incontinence in French women: prevalence, risk factors, and impact on the quality of life. Eur Urol. 2009;56(1):177-83.
31. Hunskaar S LG, Sykes D, Voss S. The prevalence of urinary incontinence in women in four European countries. BJU Int. 2004;93(3):324-330.