

Prevalence and risk factors for pelvic floor symptoms in women in rural El Salvador

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Received: 19 July 2006 / Accepted: 11 December 2006 / Published online: 9 January 2007

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Abstract Our aim was to assess the frequency of pelvic floor symptoms among women in rural El Salvador. After written informed consent was obtained, we administered the short form of the urodynamic distress inventory (UDI-6) plus four other pelvic floor questions to 236 women aged 30 to 75 in rural El Salvador attending a general medicine or gynecology clinic. Average (SD) age, parity, and body mass index were 48.0 (8.4) years, 5.9 (3.4), and 26.9 (4.9) kg/m², respectively. Ten (4.2%) women had a prior hysterectomy, 16 (6.8%) women were smokers, and 108 (45.8%) women were postmenopausal. Seventy-one percent of women reported urinary incontinence (UI); 49.3 and 61.1% of women reported urge UI and stress UI, respectively. Forty-one percent of women reported fecal incontinence (FI) of solid or liquid stool. Women with UI were significantly more likely to have had a hysterectomy compared to women without UI. Women with FI had significantly fewer years of education when compared to women without FI. In conclusion, pelvic floor symptoms are highly prevalent among women in rural El Salvador.

Presented at the 32nd annual meeting of the Society of Gynecologic Surgeons, Tucson, AZ, USA, April 3–5, 2006.

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Keywords Urinary incontinence · Fecal incontinence · El Salvador · Pelvic floor symptoms

Introduction

Urinary and anal incontinence are known to have a significant impact on a woman's quality of life. Urinary incontinence (UI) is a global problem with an estimated prevalence worldwide of 27.6% [1]. Anal incontinence (loss of solid or liquid stool or flatus) remains less well studied; however, one recent study looking at a gynecologic population in the USA revealed the incidence of fecal incontinence (FI) (loss of solid or liquid stool) to be as high as 19.7% [2]. Women in rural El Salvador in general are highly parous; this may place them at high risk for the subsequent development of symptoms related to the pelvic floor. Furthermore, access to health care is limited in this part of the world. The prevalence of pelvic floor symptoms in El Salvador has not been previously studied. We therefore sought to estimate the prevalence of urinary and anal incontinence in a sample of women in rural El Salvador.

Materials and methods

In January 2005, the short form of the urodynamic distress inventory (UDI-6) [3] plus four other pelvic floor questions (Appendices 1 and 2) were administered to women aged 30 to 75 in rural El Salvador with the assistance two trained researchers (A.M.B. and F.C.). The data were collected as part of a larger study evaluating women's attitudes towards reproductive health and menopause. Demographic data were collected from each woman during the course of the

Table 1 Patient demographics

	n=236
Age (years)	
Mean (SD)	48.0 (8.4)
Parity	
Mean (SD)	5.9 (3.4)
Age at first birth (years)	
Mean (SD)	19.3 (3.6)
BMI (kg/m ²) ^a	
Mean (SD)	26.9 (4.9)
Number of years of education	
Median (range)	3 (0–16)
Number of servings of meat per week	
Median (range)	1 (0–7)
Hysterectomy	10 (4.2%)
Smoker	16 (6.8%)
Work outside home	46 (19.5%)
Menopausal	108 (45.8%)

^a Height and weight data incomplete for 45 women

interview. Collected data included age, parity, age at first birth, height, weight, history of hysterectomy, menopausal status, smoking status, number of servings of meat per week, number of years of education, and work status. The number of servings of meat per week was used as a crude marker of overall nutritional intake. All women were attending a general medicine clinic for nongynecologic complaints or a gynecology clinic for routine screening. All terminology conforms to the International Continence Society standards [4]. Written informed consent was obtained from all participants. The ethics review board at Hampshire College approved this study.

Statistical analysis was performed using two sided Student's *t* test, one-way ANOVA and Chi square contingency table analysis, as appropriate. When statistical significance was found between the four groups using ANOVA, Bonferroni-adjusted *t* test was used to compare the four groups.

Results

Two hundred and thirty-six women, ranging from 31 to 75 years old, were included. The age distribution was as follows: age ≤39 (34 women), age 40–49 (113 women), age 50–59 (63 women), and age ≥60 (26 women). Patient demographic data are given in Table 1.

The frequency of UI and FI by degree of bother is given in Table 2. The overall prevalence of UI was 70.8%. The prevalences of urge (UUI), stress (SUI), and mixed urinary incontinence (MUI) were 9.9, 21.7, and 39.4%, respectively. The overall prevalence of FI (incontinence of solid or liquid stool) was 41.1; 27.0 and 29.2% of women reported incontinence of solid and liquid stool, respectively. The prevalence of double incontinence (both UI and FI) was 33.1%.

Rate of incontinence by age group is given in Fig. 1. Women less than 39 years of age had significantly less UUI compared to women aged 40–49 and women aged 50–59. There was no difference in rates of SUI or FI.

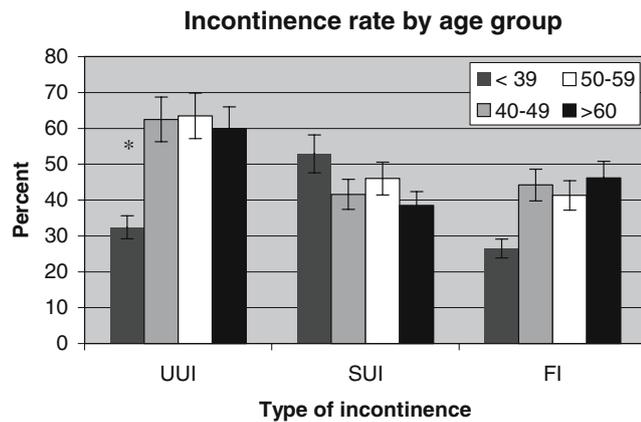
The frequency of other pelvic floor symptoms is given in Table 3. Urinary frequency was reported by 78.7% of women, although 29.8% of women reported urinary frequency but were not bothered by it. Difficulty emptying the bladder and a sensation of incomplete bowel evacuation were reported by 32.9 and 34.8% of women, respectively. Pelvic pain was reported by 62.2% of women. A bulging sensation in the vaginal area was reported by 38.3% of women.

There was no difference between the women with and without UI in age, parity, age at first birth, body mass index (BMI), menopausal status, smoking status, number of servings of meat per week, number of years of education, or status of working outside the home. Women with UI were significantly more likely to have had hysterectomies (6.0 vs 0%; *p*=0.04) and were significantly more likely to report FI (46.7 vs 27.5%; *p*=0.009) when compared to women who did not report UI. They were also more likely to report difficulty in emptying the bladder (40.0 vs 15.2%, *p*=0.003), pelvic pain (70.1 vs 43.1%, *p*=0.001), and vaginal bulging (43.3 vs 26.5%, *p*=0.02).

Table 2 Urinary and fecal incontinence by degree of bother

Symptom present?	Degree of bother	Urinary leakage related to urgency (n=229) ^a	Urine leakage related to coughing, sneezing, or laughing (n=234)	Loss of stool that is well-formed (n=233) ^a	Loss of stool that is liquid (n=226)
No		116 (50.7%)	91 (38.9%)	170 (73.0%)	160 (70.8%)
Yes	Not at all	15 (6.6%)	11 (4.7%)	7 (3.0%)	6 (2.7%)
	Somewhat	40 (17.5%)	63 (26.9%)	20 (8.6%)	27 (11.9%)
	Moderately	23 (10.0%)	29 (12.4%)	20 (8.6%)	18 (8.0%)
	Quite a bit	35 (15.3%)	40 (17.1%)	16 (6.9%)	15 (6.6%)

^a Percentages do not add up to 100% due to rounding artifact



* $p < 0.01$ when compared to age 40-49 and 50-59

Fig. 1 Prevalence of incontinence by age group (*UUI* urge urinary incontinence, *SUI* stress urinary incontinence, *FI* fecal incontinence) Asterisks denote $p < 0.01$ when compared to ages 40–49 and 50–59

There was no difference between the women with and without FI in age, gravity, age at first birth, BMI, history of hysterectomy, menopausal status, smoking status, number of servings of meat per week, or status of working outside the home. Women with FI had significantly fewer years of education than women without FI [2.8 (3.1) vs 3.9 (4.1) years, $p=0.03$]. Women with FI were significantly more likely to report UI when compared with women without FI (80.4 vs 64.0%; $p=0.009$). They were also more likely to report difficulty in emptying the bladder (44.7 vs 24.8%, $p=0.003$), pelvic pain (72.3 vs 49.6%, $p=0.0001$), sensation of incomplete bowel evacuation (47.3 vs 26.0%, $p=0.001$), and vaginal bulging (57.9 vs 24.8%, $p=0.0001$).

Discussion

The prevalence of UI and FI among women in rural El Salvador in our study is higher than that reported in other populations. Estimates of the prevalence of UI range from 11 to 69% and vary according to the definition used and the population being evaluated [5–7]. In our population, 71% of women reported UI and 64% of women reported UI that was at least somewhat bothersome. Estimates of the

prevalence of FI range from 2 to 21% [2, 8, 9], depending again on the definition used and the population evaluated. In our population, 37% of women reported loss of liquid or solid stool that was at least somewhat bothersome.

We examined age, parity, age at first birth, BMI, history of hysterectomy, menopausal status, smoking status, number of servings of meat per week, number of years of education, and work status as possible risk factors for symptoms of UI or FI. Known risk factors for UI include advanced age, parity, greater age at first delivery, higher BMI, prior hysterectomy, higher infant birth weight, history of stroke, chronic obstructive pulmonary disease, diabetes mellitus, and poor overall health [10–14]. Among the variables examined, we found only a significant association between history of prior hysterectomy and the symptom of UI. All of the women who had a prior hysterectomy reported UI. Age, parity, age at first birth, and BMI were not significantly different between women with and without UI in this population.

Known risk factors for FI include advanced age, vaginal delivery, higher BMI, constipation, medical comorbidities, poor general health, and UI [2, 8, 9, 15]. We found that women with FI were more likely to report UI when compared to women without FI. However, we did not find age, parity, or BMI to be risk factors for FI in this population. In addition, we found that women with FI had significantly fewer years of education when compared to women without FI. According to World Health Organization estimates, over a third of all deliveries in El Salvador are unattended, and the poor and less educated are more likely to have unattended births. Unattended deliveries might lead to undiagnosed and unrepaired anal sphincter injuries that result in FI. This finding deserves further study.

We speculate that high parity and inadequate obstetrical and medical care may contribute to the high prevalence of both UI and FI in women in rural El Salvador. To further examine possible risk factors for the development of UI or FI, future studies should include details regarding obstetrical history, including mode of delivery; whether the birth took place at home or in a hospital; whether the birth was attended by a lay midwife, physician, or not at all; infant birth weight; and the presence of other medical comorbidities.

Table 3 Other pelvic floor symptoms by degree of bother

Symptom present?	Degree of bother	Urinary frequency ($n=225$)	Small amounts of urine leakage ($n=233$) ^a	Difficulty emptying bladder ($n=231$)	Sensation of incomplete bowel evacuation ($n=224$)	Pelvic pain ($n=222$) ^a	Vaginal bulging ($n=232$) ^a
No		48 (21.3%)	116 (49.8%)	155 (67.1%)	146 (65.2%)	84 (37.8%)	143 (61.6%)
Yes	Not at all	67 (29.8%)	9 (3.9%)	3 (1.3%)	6 (2.7%)	3 (1.4%)	1 (0.4%)
	Somewhat	42 (18.7%)	50 (21.5%)	25 (10.8%)	33 (14.7%)	49 (22.1%)	33 (14.2%)
	Moderately	32 (14.2%)	26 (11.2%)	17 (7.4%)	22 (9.8%)	29 (13.1%)	25 (10.8%)
	Quite a bit	36 (16.0%)	32 (13.7%)	31 (13.4%)	17 (7.6%)	57 (25.7%)	30 (12.9%)

^a Percentages do not add up to 100% due to rounding artifact

In conclusion, our study demonstrates that both UI and FI represent a significant disease burden on women in rural El Salvador. Further research is needed in this area to determine possible interventions to reduce the number of women affected by these conditions.

Appendix A

A.1 Appendix 1 Pelvic floor questionnaire

Por favor conteste las preguntas marcando con una X en la caja apropiada. Si usted no está segura de como contestar alguna pregunta, de la mejor respuesta que pueda.

1.	Orina ud. frecuentemente? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
2.	Normalmente ud. tiene pérdida de orina asociado con la sensación de urgencia o necesidad de orinar? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
3.	Normalmente ud. tiene pérdida de orina asociado con toser, estornudar o reírse? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
4.	Normalmente ud. tiene pequeñas pérdidas de orina? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
5.	Normalmente ud. tiene problemas con orinar completamente? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
6.	Normalmente ud. siente dolor en la parte de abajo de su abdomen o genitales? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
7.	Siente ud. que no a vaciado su colon completamente despues de defecar? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
8.	Normalmente ud. tiene pérdida de excremento fuera de su control si el excremento esta bien formado? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
9.	Normalmente ud. tiene pérdida de excremento fuera de su control si el excremento esta suelto o flojo? Sí la respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							
10.	Normalmente ud. tiene un bulto o algo que está saliendo que puedo ver o sentir en el area vaginal? Sí su respuesta es sí, cuánto le molesta?	No: Sí 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Nada</td> <td style="text-align: center;">Un poco</td> <td style="text-align: center;">Moderado</td> <td style="text-align: center;">Mucho</td> </tr> </table>	1	2	3	4	Nada	Un poco	Moderado	Mucho	
1	2	3	4							
Nada	Un poco	Moderado	Mucho							

Appendix B

B.1 Appendix 2 Pelvic floor questionnaire

Please answer the questions by putting an X in the appropriate box. If you are unsure about how to answer a question, give the best answer you can.

1.	Do you usually experience frequent urination? If yes, how much does it bother you?	No Yes 0								
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1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
2.	Do you usually experience urine leakage associated with a feeling of urgency, that is a strong sensation of needing to go to the bathroom? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
3.	Do you usually experience urine leakage related to coughing, sneezing, or laughing? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
4.	Do you usually experience small amounts of urine leakage (that is, drops)? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
5.	Do you usually experience difficulty emptying your bladder? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
6.	Do you usually experience pain or discomfort in the lower abdomen or genital region? If yes, how much does it bother you?	No Yes 0								
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1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
7.	Do you feel you have not completely emptied your bowels at the end of a bowel movement? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
8.	Do you usually lose your stool beyond your control if your stool is well formed? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
9.	Do you usually lose your stool beyond your control if your stool is loose or liquid? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							
10.	Do you usually have a bulge or something falling out that you can see or feel in the vaginal area? If yes, how much does it bother you?	No Yes 0								
	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Not at all</td> <td style="text-align: center;">Somewhat</td> <td style="text-align: center;">Moderately</td> <td style="text-align: center;">Quite a bit</td> </tr> </table>	1	2	3	4	Not at all	Somewhat	Moderately	Quite a bit	
1	2	3	4							
Not at all	Somewhat	Moderately	Quite a bit							

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