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The association between urinary and fecal incontinence and social isolation in older women

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Abstract

Objective—To describe the association between social isolation and urinary incontinence (UI) and fecal incontinence (FI) in older women.

Methods—We conducted a secondary database analysis of the National Social Life, Health and Aging Project (NSHAP) for women aged 57 to 85 years old. Our primary outcome was self-report of often feeling isolated. We explored self-report of daily UI and weekly FI. Two logistic regression analyses were performed to assess the association between often feeling isolated and 1) daily UI and 2) weekly fecal incontinence.

Results—A total of 1,412 women were included in our analysis. Daily UI was reported by 12.5% (177/1,412) of community-dwelling older women. More women with daily UI reported often feeling isolated (6.6%, 95% CI [1.3–11.9] vs. 2.6%, 95% [1.7–3.5], $p=.04$) compared with women without daily UI. Women with daily UI had 3.0 (95% CI 1.1, 7.6) increased odds of often feeling isolated after adjusting for depressive symptoms, age, race, education, and overall health.

Weekly FI was reported by 2.9% (41/1,412) of women. Weekly FI and often feeling isolated were associated on univariable analysis (Crude Odds Ratio(OR) = 4.6 (95% CI 1.4, 15.1). However after adjusting for depressive symptoms, age, race, education, and overall health the association between weekly FI and often feeling isolated was not significant (Adjusted OR=0.65 (95% CI 0.1, 5.3, $p=0.65$)).

Conclusion—After adjusting for confounders, daily UI was significantly associated with often feeling isolated. Weekly FI was not found to be associated with often feeling isolated on multivariable logistic regression.

Keywords

fecal incontinence; loneliness; social isolation; urinary incontinence

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Introduction

Urinary incontinence (UI) and fecal incontinence (FI) are common and embarrassing conditions that affect multiple aspects of a woman's daily life and overall health.

Women with UI have been shown to have higher emotional disturbances compared with continent women [1]. UI has been associated with loneliness, depression and sadness [2–7]. Melville et al. found that women with severe UI had higher depression scores compared with continent women [7]. Additionally, similar depression scores were observed in women with severe UI compared with women who have severe medical co-morbidities, such as chronic obstructive pulmonary disease and congestive heart failure. Sung et al. found women with severe UI had increased depression and that depression improved with improvement in incontinence [8]. In addition to emotional disturbances, women with UI have also been shown to have decrease physical activity level [9].

The multi-factorial impact of FI on women's lives is less well studied. Risk factors for FI include increasing age, female gender, increasing medical comorbidities, major depression, diabetes and operate vaginal delivery [10]. Women with FI were found to have a higher incidence of stroke, chronic cough, diabetes, night awakening, and falls compared to women without FI [11].

The impact of UI and FI on women's social lives and personal relationships has been incompletely explored. We hypothesize that community-dwelling women with UI and FI may be less likely to participate in social activities outside their home and have less social support compared with older continent women. Our primary objective was to explore the association between social isolation in community dwelling older women with and without UI. Our secondary objective was to explore the association of social isolation in community dwelling older women with and without FI.

Methods

We conducted a secondary database analysis of the National Social Life, Health and Aging Project (NSHAP) [12]. The NSHAP is a cross-sectional study conducted between 2005–2006 surveying community-dwelling men and women in the United States between the ages of 57–85 years. The NSHAP was conducted to examine sexual practices and behaviors, overall health, and social networks of older adults. Adults were targeted for possible participation in the NSHAP study from a prior population-based study, the Health and Retirement Study [13–14]. The NSHAP dataset is unique in that it provides adequate representation of previously understudied populations, such as Black and Hispanic women, by oversampling these targeted groups with an overall survey response rate of 75.5% [12]. Information in the NSHAP was obtained from in-home interviews by trained professional interviewers in both English and Spanish using computer-assisted personal interview (CAPI) methods [15–16]. Data was collected by the National Opinion Research Center (NORC) through the University of Chicago and maintained by the Institute for Social Research (ISR) at the University of Michigan to ensure the quality of the dataset [15–16]. Written exemption for this study was obtained from the Yale University Institutional Review Board as this work involved research of an existing dataset from a public source.

For this analysis, we included all women 57 to 85 years old ($n = 1,510$). Women were excluded if they did not answer questions about or had missing data for UI and FI. Women were categorized as having daily UI if they answered “daily” to the question, “How frequently...have you had difficulty controlling your bladder, including leaking small amounts of urine, leaking when you cough or sneeze, or not being able to make it to the bathroom on time?” Women were categorized as having weekly FI if they answered “a few

times a week” or “daily” to the question, “How frequently...have you lost control of your bowels (stool incontinence or anal incontinence)?” This grouping of women with daily or weekly FI was used for analysis purposes due to the small number of women with daily FI only. Recent epidemiological studies have focused on women who report any FI in the last year. We chose to focus on women who reported more frequent symptoms of FI as we wanted to capture symptoms that would have a direct impact on women’s lives.

Our primary outcome of interest was the self-report of often feeling isolated in response to the question, “How often do you feel isolated from others?” Social isolation was measured through quantifying perceived social isolation, social disconnectedness, and loneliness. Cornwell and Waite explored 17 indicators of social isolation to create two distinct scales: perceived social isolation and social disconnectedness. Perceived social isolation was measured with questions discussing the frequency of opening up to family, frequency of relying on family, frequency of opening up to friends, frequency of relying on friends, frequency of opening up to spouse/partner, and frequency of relying on spouse/partner with 3 answer options ranging from “hardly ever or never” to “often.” Social disconnectedness was quantified by evaluating social network size, social network range, frequency of interaction, proportion of social network members in the home, number of friends, frequency of attending group meetings, frequency of socializing with friends and family, and frequency of volunteering [19]. For this study, we looked at women with 4 or more friends, socializing with family and friends more than weekly, volunteering in the past year, and attending a group meeting in the past year. [19] Finally, a modified version of the UCLA loneliness scale was to quantify symptoms of loneliness.[17–18] The UCLA loneliness scale was first developed by Russell et al in 1978. The shortened version used by the NSHAP was developed and validated in 2004 using 3 questions on a 3-point scale.[18] In addition to feelings of isolation, respondents were asked how often they felt a lack of companionship and how often they felt left out. Modified UCLA loneliness scale scores ranged from 3 to 9, with higher scores indicating greater feelings of loneliness.

Demographics including age, race, education and self-reported overall health were recorded. We also reported scores from the modified Center for Epidemiological Studies-Depression (CES-D) Scale and Hospital Anxiety and Depression Scale (HADS) as to quantify depressive symptoms and symptoms of anxiety. The modified CES-D scale is an 11 question screening test for depressive symptoms [20–21]. Each question had a score from 0–3, with score scales ranging from 0–31 and higher scores indicating more depressive symptoms. The HADS was developed by Zigmond et al in 1983 with 7 questions relating to anxiety in hospital patients [20, 22]. Each question was graded by a Likert scale of 0–3, with scores ranging from 0–21 and higher scores reflecting greater symptoms of anxiety.

Statistical analyses, including descriptive and inferential statistics with percentage estimates and 95% confidence intervals (CI), were performed as appropriate. The NSHAP dataset allowed data to be weighted to provide an estimate of population characteristics representative of community-dwelling older Americans aged 57 to 85 years. Survey weights were used to account for the differential probability of inclusion in the sample and differential probability of nonresponse in all the analyses. Percentage estimates and 95% CI were obtained to report weighted frequencies. Model fitting and variance estimates used in the construction of CI account for the stratified and clustered nature of the design to produce unbiased estimates of standard errors.

Two logistic regression analyses were performed to assess the association between self-report of often feeling isolated (primary outcome) and 1) daily UI and 2) weekly fecal incontinence. Potential confounders were considered for inclusion in the final models based on their significance in univariable analysis ($p < .1$). Significant confounders were included

in the final adjusted models if they continued to impact the final model. Statistical analyses were performed using SAS 9.2 (*SAS Institute, Inc., Cary, NC*) and STATA 11.0 (*StataCorp, College Station, TX*).

Results

A total of 1,412 women were included in our analysis. Seventy-six women and 22 women were excluded due to missing data in regard to UI and FI, respectively.

Daily UI was reported by 12.5% (177/1,412) of community-dwelling older women. Weekly, monthly, or yearly UI was reported by 40.2% (568/1,412) of women. Forty seven percent (667/1,412) of women reported no urinary incontinence in the past year.

Weekly or daily FI was reported by 2.9% (41/1,412) of women with 13 women reporting daily FI. Ninety-two percent (1,259/1,412) of women reported no fecal incontinence in the past 12 months and 8.2% (112/1,412) of women reported monthly or yearly fecal incontinence. Symptoms of both daily UI and weekly FI were reported by 1.2 % (17/1,412) of women.

Urinary Incontinence

Women with daily UI were older than women without daily UI (70 years $\pm$ 0.7 vs. 68 years $\pm$ 9.3, $p=.01$). (Table 1) No differences in race or education level were observed. Overall health reported as “excellent” or “very good” in 25.1% (44/177) of women with daily UI and 43.4% (534/1,235) of women without daily UI ($p<.01$). Women with daily UI had significantly more depressive symptoms than women with no daily UI as measured by a higher mean CES-D score (6.7 $\pm$ 0.5 vs. 5.5 $\pm$ 0.2, $p=.02$). Women with daily UI had more anxiety symptoms measured by higher mean HADS scores compared with women with no daily UI (5.2 $\pm$ 0.5 vs. 3.7 $\pm$ 0.1, $p<.01$).

Perceived isolation—More women with daily UI reported often feeling isolated (6.6%, 95% CI [1.3–11.9] vs. 2.6%, 95% [1.7–3.5], $p=.04$), often feeling a lack of companionship (12.2%, 95% CI [5.1–19.2] vs. 5.3%, 95% CI [3.8–6.9], $p<.01$) and often feeling left out (7.95, 95% CI [2.3–13.5] vs. 2.7%, 95% CI [1.7–3.6], $p<.01$) compared with women without daily UI.(Table 2) However, women with daily UI were similar to women without daily UI in their reports of often opening up to family, often relying on family, often opening up to friends/spouse/partner and often relying on spouse/partner.

When we excluded women who reported weekly, monthly, and yearly UI from the analysis, we had similar findings in regard to the primary outcome, often feeling isolated.

Social disconnectedness—Socializing with friends and family more than weekly, volunteering in the past year, and attendance at group events in the past year were similar between women with daily UI and women without daily UI. (Table 2) However, less women with daily UI reported having more than 4 friends compared with women without daily UI (68.2%, 95% CI [58.6–77.7] vs. 77.9%, 95% CI [74.7–81.1], $p=.04$).

Loneliness—Mean score of the UCLA Loneliness scale was 4.5 $\pm$ 0.2 for women with daily UI and 4.0 $\pm$ 0.1 for women without daily UI ($p=.003$).

Regression analysis—Women with daily UI had 3.0 (95% CI 1.1, 7.6) increased odds of often feeling isolated after adjusting for CES-D score, age category, race, education level, and self-reported overall health. (Table 3)

Fecal incontinence

Women with weekly FI were more likely to report less than high school education compared with women without weekly FI (45.8%, 95% CI [25–66.7] vs. 17.6%, 95% CI [14.4–20.8], $p=.02$). (Table 4) Women with weekly FI were also likely to report “poor” health compared with women without weekly FI (33.0%, 95% CI [14.9–51.2] vs. 5.4%, 95% CI [4–6.9], $p<.01$). Women with weekly FI had more depressive symptoms measured by higher mean CES-D scores compared with women without weekly FI (9.5 ± 1.2 vs. 5.5 ± 0.1 , $p<.01$). In addition, they had more anxiety symptoms measured by higher mean HADS scores FI (6.3 ± 1 vs. 3.8 ± 0.1 , $p<.01$).

Social disconnectedness, Perceived isolation, and Loneliness—Women with weekly FI were more likely to report “often” feeling isolated (11.6, 95% CI [0–23.7] vs. 2.8, 95% CI 1.9–3.7], $p=.01$) than women without weekly FI. When we analyzed questions about social disconnectedness, women with and without weekly FI were similar with regard to network size, volunteering in the past and attendance at group meetings in the past year. (Table 5) Interestingly, women with weekly FI were more likely to rely on their spouse or partner compared with women without weekly FI (97.7, 95% CI [92.8–100] vs. 83.7, 95% CI [81.1–86.3], $p=.04$). Finally, women with weekly FI had significantly higher UCLA loneliness scores compared with women without weekly FI (6.1 ± 0.5 vs. 5 ± 0.1 , $p=.026$).

When we excluded women with monthly and yearly FI from our analysis, we had similar findings in regard to the primary outcome, often feeling isolated.

Regression analysis—Weekly FI and often feeling isolated were associated on univariable analysis (Crude OR = 4.6 (95% CI 1.4, 15.1). However after adjusting for significant confounders of depression, age category, race, education level, and self-reported overall health the association between weekly FI and often feeling isolated was not statistically significant (Adjusted OR=0.65 (95% CI 0.1, 5.3, $p=0.65$)). (Table 6)

Conclusion

We found a prevalence of daily UI of 12.5% and weekly FI of 2.9% in older community dwelling women. Daily UI was associated with often feeling isolated and loneliness. Consistent with the findings of others, we found UI and FI were associated with increased depressive symptoms, increased anxiety, and decreased perceptions of overall health. [2–8, 10, 11]

Social isolation

Previous studies have explored the relationship between incontinence and social isolation. Our study examined two distinct aspects of social isolation, social disconnectedness and perceived isolation. Social disconnectedness reflects a woman’s lack of contact with others which is limited by her life situation and perceived isolation reflects a woman’s subjective experience of lack of companionship and support [19].

Other authors have used other measures of social isolation and quality of life scales to assess the impacts of UI with similar findings to our results. Grimbley et al found a higher score (15.0 ± 1.8 vs. 10.1 ± 1.0), $p<.005$) for emotional disturbance among incontinent women compared with aged-match continent women using the Nottingham health quality of life questionnaire, which contains dichotomous questions assessing degree of distress in the areas of emotional reactions, social isolation and physical mobility [1]. In this same cohort of 313 women, Grimbley et al also found significantly high scores on the social isolation dimension of the Nottingham questionnaire in women suffering from stress urinary

incontinence (12.4 ± 2.3); urge urinary incontinence (17.3 ± 3.4); mixed urinary incontinence (14.3 ± 2.9) compare to their aged match control (7.1 ± 0.8), ($p < .05$) from a representative sample of the total population ($n=120$). Similarly, Fultz et al used the Incontinence Quality of Life Instrument (I-QOL) and measured social embarrassment in women with and without bothersome stress UI compared with continent women and found lower I-QOL scores for women who were moderately or extremely bothered by their incontinence symptoms ($n=174$) compared to controls ($n=136$) (71.6 vs. 91.4 , $p=.01$) [2]. These findings were limited as Fultz et al. focused primarily on social embarrassment and did not explore perceived isolation and social disconnectedness.

Loneliness

The association of UI and FI with loneliness has also been explored in prior studies. Our study again confirms the significant association of UI and FI with loneliness. Scores on UCLA loneliness scales were higher for women with UI or FI compared with continent women. Women in our study with UI or FI had significantly higher scores on loneliness, indicating a greater degree of loneliness, which has been associated with both depression and anxiety [18]. A strength of our study was the inclusion of validated measurements of loneliness, depression, and anxiety scales to quantify all three emotions. We found that loneliness, depressive symptoms and anxiety symptoms are significantly more prevalent in community-dwelling older women with UI and FI compared with continent women.

Our study is limited by its cross-sectional design. Women were not asked about social isolation before and after the development of incontinence, therefore a causal relationship cannot be established. Our study is also limited by being a secondary database analysis and further information on certain variables was not collected. Specifically, we do not have information on type of urinary incontinence (stress UI, urge UI, or mixed UI) although information on UI severity was available. A possible limitation to this study is the comparison groups paired with women with daily UI and women with weekly FI. The comparison groups used include women with no incontinence as well as women with more than daily UI or more than weekly FI, respectively. This was done because we believe fewer incontinence occurrences will have a less drastic impact on women's social lives than for women with daily UI or daily/weekly FI. In addition, removing the women with more than daily UI or more than weekly FI did not significantly affect the statistical analysis. A final limitation of this study includes limitation in our regression analysis for weekly FI. On multivariable logistic regression, a significant association between weekly FI and the outcome of often feeling isolated was not found. However, only 41 women reported weekly FI which limits the findings our regression analysis. Other variables, notably CES-D scores (indicating depressive symptoms) and overall reported health impacted the regression model and were significantly associated with often feeling isolated.

In conclusion, we found that daily UI was associated with often feeling isolated and increased loneliness. We further demonstrated that women with UI and FI had increased depressive symptoms, increased anxiety and decreased self-report of overall health compared with continent women which adds to the growing body of evidence that UI and FI are conditions that negatively affect multiple aspects of a woman's life.

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Table 1

Demographics of community dwelling women with and without daily urinary incontinence from NSHAP database

Variable	Daily Urinary Incontinence N= 177	No Daily Urinary Incontinence ^a N= 1,235	P
Age (Year, Mean $\pm$ SEM)	70 $\pm$ 0.7	68 $\pm$ 0.3	.01
Age Category:			.03
57–64	36.7 (28.1–45.3)	40.7 (37.4–44)	
65–74	29 (22.1–35.8)	35.5 (32.4–38.7)	
75–85	34.4 (25.2–43.5)	23.8 (21.3–26.4)	
Race/Ethnicity			.32
White	84.5 (76.8–92.3)	80.7 (76.9–84.5)	
Black	8.3 (4.3–12.4)	11.1 (8.2–14)	
Hispanic, non-black	6.2 (0–12.9)	6.1 (3.4–8.8)	
Other	0.9 (0–2.2)	2.2 (0.9–3.4)	
Education			.83
Less than high school	19.9 (12.2–27.5)	18.2 (15.3–21.2)	
High school or equiv.	32.2 (24–40.5)	29.5 (26.4–32.7)	
Some college	30.2 (21.4–39.1)	33.3 (29.7–36.9)	
Bachelor's degree or higher	17.6 (9.5–25.8)	18.9 (15.6–22.1)	
Self-Reported Health			<.01
Poor	8 (3–13)	6 (4.4–7.5)	
Fair	26.1 (18–34.1)	15.9 (13.6–18.2)	
Good	38 (29–46.9)	30.6 (27.3–33.8)	
Very Good	19.8 (12.1–27.6)	33.2 (30.4–36)	
Excellent	8.1 (3–13.2)	14.3 (11.2–17.5)	
How happy are you?			<.01
Extremely happy	5.3 (2–8.7)	14.7 (12–17.4)	
Very happy	38.3 (30.6–46)	40.4 (37.4–43.4)	
Pretty happy	44 (35.5–52.5)	35.4 (32.6–38.2)	
Unhappy sometimes	10.7 (4.5–17)	8.9 (7.4–10.4)	
Unhappy usually	1.7 (0–3.4)	0.6 (0.2–1)	
CES-D Score (Mean $\pm$ SEM)	6.7 $\pm$ 0.5	5.5 $\pm$ 0.2	.02
HADS Anxiety Index (Mean $\pm$ SEM)	5.2 $\pm$ 0.5	3.7 $\pm$ 0.1	<.01

^a“No Daily UI” includes women with no urinary incontinence in the past 12 months (n= 667) and women with weekly, monthly, or yearly urinary incontinence (n= 568).

All values listed as percent (95% Confidence Interval) unless otherwise specified.

NSHAP: National Social Life, Health, and Aging Project

SEM: standard error of mean

CES-D: Center for Epidemiological Studies-Depression Scale. Range 0–33; higher score indicates greater depressive symptomology

HADS: Hospital Anxiety and Depression Scale. Range 0–21; higher score indicates higher anxiety level

Table 2

Social disconnectedness and perceived social isolation in women with and without daily urinary incontinence

Variable	Daily Urinary Incontinence N= 177	No Daily Urinary Incontinence N= 1,235	P
Often feel isolated	6.6 (1.3–11.9)	2.6 (1.7–3.5)	.04
Perceived Social Isolation			
Often feel left out	7.9 (2.3–13.5)	2.7 (1.7–3.6)	<.01
Often feel that you lack companionship	12.2 (5.1–19.2)	5.3 (3.8–6.9)	<.01
Often open up to family	59.5 (51.2–67.8)	56.2 (53.2–59.2)	.41
Often rely on family	72.9 (65.6–80.3)	71.8 (68.2–75.3)	.76
Often open up to friends	35.9 (26.6–45.2)	35.6 (31.9–39.4)	.96
Often rely on friends	55 (45.2–64.8)	50.7 (46.5–54.8)	.39
Often open up to spouse/partner	74.2 (63.7–84.8)	76.5 (72.8–80.2)	.69
Often rely on spouse/partner	85.2 (77.1–93.3)	83.9 (81–86.8)	.78
Social Disconnectedness			
Number of friends 4	68.2 (58.6–77.7)	77.9 (74.7–81.1)	.04
Socializing weekly with friends	15 (8.4–21.6)	19.1 (16.1–22)	.27
Volunteer in past year	62.5 (51.2–73.8)	68.5 (64.9–72.1)	.29
Attend group meeting in past year	68.3 (57.6–78.9)	72.5 (68.9–76.1)	.41
UCLA Loneliness Scale (Mean ±SD)	4.5±0.2	4.0 ± 0.1	<.01

^a“No Daily UI” includes women with no urinary incontinence in the past 12 months (n= 667) and women with weekly, monthly, or yearly urinary incontinence (n= 568).

All values listed as percent (95% Confidence Interval) unless otherwise specified.

UCLA Loneliness Scale: range 3–9; higher score indicates greater loneliness.

Table 3Logistic regression model for association of feeling isolated and daily urinary incontinence ^a

Variable	Adjusted OR	95% CI	P
Daily Urinary Incontinence	3.0	1.1–7.6	.03
CES-D Score	1.3	1.2–1.4	<.01
Age Group, years (57–64= referent)			.03
65–74	0.2	0.1–0.9	
75–85	1.7	0.8–3.8	
Race (White= referent)			<.01
Black	4.6	1.9–11.1	
Hispanic, non-black, other	0.9	0.1–6.5	
Education (Less than high school= referent)			.29
High School or Equivalent	0.7	0.2–2.8	
Some College	0.6	0.2–2.0	
Bachelor's Degree or Higher	0.2	0–1.2	
Self-Reported Health (Poor= referent)			.23
Fair	0.6	0.2–1.8	
Good	1.1	0.4–2.8	
Very Good	0.2	0.1–0.9	
Excellent	1.3	0.3–6.3	

OR= Odds Ratio; CI= Confidence Interval; CES-D: Center for Epidemiological Studies-Depression Scale.

^a Modeling event= Often feel isolated (vs. hardly ever, never, some of the time)

Table 4

Demographics of community dwelling women with and without weekly fecal incontinence from NSHAP database

Variable	Weekly Fecal Incontinence n=41	No Weekly Fecal Incontinence ^a n=1,371	P
Age (Year, Mean $\pm$ SEM)	68.5 $\pm$ 1.5	68.2 $\pm$ 0.3	.87
Age Category:			.72
57–64	39.8 (17.9–61.7)	40.2 (36.9–43.4)	
65–74	39.8 (21.4–58.2)	34.6 (31.6–37.6)	
75–85	20.4 (6–34.8)	25.2 (22.6–27.8)	
Race/Ethnicity			.90
White	82 (70.2–93.8)	81.1 (77.2–85)	
Black	10.1 (2.3–17.9)	10.8 (7.9–13.7)	
Hispanic, non-black	6.9 (0–14.5)	6.1 (3.1–9.1)	
Other	1 (0–3.1)	2 (0.9–3.2)	
Education			.02
Less than high school	45.8 (25–66.7)	17.6 (14.4–20.8)	
High school or equiv.	23.8 (8.9–38.7)	30.1 (27.1–33)	
Some college	16 (3.5–28.6)	33.5 (29.7–37.3)	
Bachelor's degree or higher	14.3 (0–31.8)	18.9 (15.8–22)	
Self-Reported Health			<.01
Poor	33 (14.9–51.2)	5.4 (4–6.9)	
Fair	27.2 (13.2–41.2)	16.8 (14.6–19.1)	
Good	14.3 (2.8–25.8)	32 (29–34.9)	
Very Good	15.1 (0–33)	32.1 (29.5–34.8)	
Excellent	10.4 (0–22.8)	13.7 (10.8–16.6)	
How happy are you?			.24
Extremely happy	2 (0–6.3)	0.7 (0.3–1.1)	
Very happy	5.1 (0–10.8)	9.3 (7.9–10.7)	
Pretty happy	49.6 (29.9–69.4)	36 (33.3–38.7)	
Unhappy sometimes	30.3 (12.8–47.9)	40.4 (37.6–43.3)	
Unhappy usually	13 (0–31.3)	13.6 (11.3–15.9)	
CES-D Score (Mean $\pm$ SEM)	9.5 $\pm$ 1.2	5.5 $\pm$ 0.1	<.01
HADS Anxiety Index (Mean $\pm$ SEM)	6.3 $\pm$ 1	3.8 $\pm$ 0.1	<.01
UCLA Loneliness Scale (Mean $\pm$ SEM)	6.1 $\pm$ 0.5	5 $\pm$ 0.1	.03

^a“No Weekly Fecal Incontinence” includes women with no fecal incontinence in the past 12 months and women with monthly (n= 36) or yearly fecal incontinence (n= 76).

All values listed as percent (95% Confidence Interval) unless otherwise specified.

NSHAP: National Social Life, Health, and Aging Project

SEM: standard error of mean

CES-D: Center for Epidemiological Studies-Depression Scale. Range 0–33; higher score indicates greater depressive symptomology.

HADS: Hospital Anxiety and Depression Scale. Range 0–21; higher score indicates higher anxiety level.

UCLA Loneliness Scale: range 3–9; higher score indicates greater loneliness.

Table 5

Social disconnectedness and perceived social isolation in women with and without weekly fecal incontinence

Variable	Weekly Fecal Incontinence n=41	No Weekly Fecal Incontinence ^a n=1,371	P
Often feel isolated	11.6 (0–23.7)	2.8 (1.9–3.7)	.01
Perceived Social Isolation			
Often open up to family	53.9 (32–75.7)	56.7 (53.6–59.8)	.79
Often rely on family	71.6 (53.9–89.4)	71.9 (68.5–75.3)	.98
Often open up to friends	28 (8.7–47.2)	35.9 (32.6–39.2)	.44
Often rely on friends	55.9 (33.3–78.6)	51 (47.3–54.8)	.65
Often open up to spouse/partner	89.1 (76.2–100)	75.9 (72.6–79.2)	.14
Often rely on spouse/partner	97.7 (92.8–100)	83.7 (81.1–86.3)	.04
Often feel that you lack companionship	11.3 (0–22.8)	6 (4.2–7.8)	.21
Often feel left out	6.2 (0–15)	3.2 (2.1–4.3)	.38
Social Disconnectedness			
Number of friends 4	71.7 (54.7–88.8)	76.9 (73.7–80)	.53
Socializing with family & friends more than weekly	16.2 (3.1–29.2)	18.7 (15.8–21.6)	.73
Volunteer in past year	57.7 (35.2–80.1)	68.1 (64.6–71.6)	.32
Attend group meeting in past year	59.4 (36.6–82.2)	72.4 (68.8–76)	.22
UCLA Loneliness Scale (Mean ±SEM)	6.1 ± 0.5	5 ± 0.1	.03

^a“No Weekly Fecal Incontinence” includes women with no fecal incontinence in the past 12 months and women with monthly (n=36) or yearly fecal incontinence (n=76).

All values listed as percent (95% Confidence Interval) unless otherwise specified.

UCLA Loneliness Scale: range 3–9; higher score indicates greater loneliness.

Table 6Logistic regression model for association of social isolation and weekly fecal incontinence ^a

Variable	Adjusted OR	95% CI	P
Weekly Fecal Incontinence	0.6	0.1–5.3	.652
CES-D Score	1.3	1.2–1.4	<.0001
Age Group, years (57–64= referent)			.016
65–74	0.3	0.1–1.0	
75–85	1.8	0.8–4.1	
Race (White= referent)			.009
Black	4.0	1.6–10.0	
Hispanic, non-black, other	0.9	0.1–6.3	
Education (Less than high school= referent)			.379
High School or Equivalent	0.6	0.1–2.8	
Some College	0.7	0.2–2.1	
Bachelor's Degree or Higher	0.2	0–1.3	
Self-Reported Health (Poor= referent)			.193
Fair	0.8	0.2–2.4	
Good	1.1	0.4–2.7	
Very Good	0.2	0.1–0.9	
Excellent	1.3	0.2–6.5	

OR= Odds Ratio; CI= Confidence Interval; CES-D: Center for Epidemiological Studies-Depression Scale.

^a Modeling event= Often feel isolated (vs. hardly ever, never, some of the time)