

An Observational Study to Assess the Urinary Incontinence, Mental Health and Loneliness among Community-Dwelling Older AdultsRakesh Kumar¹, Archana Sinha², Purushottam Kumar³¹Assistant Professor, Department of Urology, AIIMS, Patna, Bihar, India²Medical Officer, Department of Microbiology, BMIMS, Pawapuri, Nalanda, Bihar, India³Assistant Professor, Department of Medicine, BMIMS, Pawapuri, Nalanda, Bihar, India

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Abstract**Aim:** The aim of the present study was to assess the urinary incontinence, mental health and loneliness among community-dwelling older adults.**Methods:** The present study was conducted department of Urology for one year In brief, TILDA was a nationally representative survey of community-based adults aged 50 and above. The target sample included every household resident meeting this age criterion. 200 patients were included in the study. In the current study, the analysis was restricted to participants aged 50 years and above and those who completed the self-completion questionnaires (SCQ).**Results:** Majority of the patients was belonged to the age groups 50-59 years and 52.5% were females in the study. 42.5% had secondary education level and 47.5% had chronic conditions more than two. 40% were moderately integrated. In the unadjusted model, the OR (95% CI) was 1.74. This was attenuated when the model was adjusted for sociodemographic factors, chronic conditions, and ADL disability but remained statistically significant. Further adjustment for the SNI had little effect on the association. The OR became non-significant when depression was included in the model but not when anxiety was included. When the frequency of UI or activity limitations due to UI were taken into account, compared to no UI, having activity limitations due to UI was associated with particularly high odds for loneliness even in models adjusted for either depression or anxiety (Model 4 and 5) although the OR was no longer significant when depression and anxiety were included simultaneously in the model (Model 6). Frequency of UI was not as strongly associated with loneliness as activity limitations due to UI and became non-significant in the models where depression and anxiety were included. In the analysis restricted to those with UI, a higher frequency of UI was not associated with elevated odds for loneliness, but activity limitations due to UI were associated with significantly higher odds for loneliness in all models except those which adjusted for depression.**Conclusion:** UI is associated with higher odds for loneliness among older community-dwelling adults but this association is largely explained by comorbid mental health problems, in particular, depression.**Keywords:** Urinary incontinence, Lonely, Anxiety, Depression

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Introduction

In the list of signs and symptoms used in epidemiological health surveys, the report of “involuntary loss of urine in the last year” is a simple and useful strategy to operationalize and estimate the presence of urinary incontinence (UI) in community-dwelling older adults. [1] An affirmative answer to the question is an important marker of health morbidity and worse physical and cognitive functionality, with negative repercussions on quality of life and sleep quality and an aggravating factor for conditions like frailty, falls, hospitalization, institutionalization and death. [2-4] Regardless of clinical classification, it is estimated

that 50% of women will experience UI symptoms throughout their lives, and the prevalence of UI is higher among women than among men (60% to 30%). [1,2,5] Based on a systematic review and meta-analysis, a prevalence of UI of 37.1% in older adult women is estimated, with rates varying between 29.6 and 45.4%. Older adult women are about twice as susceptible to UI as older men. [2,6]

As indicated by data from clinical research literature, older adults with UI are more likely to be restricted in the performance of daily self-care and social participation activities, experience increased feelings of loneliness and social isolation, and

present increased risk for depression and anxiety. [7-10] The negative effects of UI on social participation constitute a potential barrier to public and clinical goals of promoting involvement and maintenance of social participation in old age. Defined as “involvement in activities that provide interactions with other people in the community” [11], social participation is a highly valued concept in gerontology, considered one of the pillars of the promotion of active aging and the Decade of Healthy Aging (2021-2030). [12] Older adults with UI are less likely to engage in social activities outside the home, such as going shopping or attending church or religious services [13,14], as evidenced by samples with different sociodemographics³ and cultural conditions. [15]

Despite the large number of studies on UI and its associated adverse health outcomes, one condition which has been little studied to date in relation to UI is loneliness. This is an important research gap given that: (a) incontinent individuals can experience feelings of frustration, embarrassment and shame [16,17] as a result of their condition and will sometimes reduce/avoid social contacts and activities in order to control UI and its effects¹⁶, which may lead to increased social isolation and feelings of loneliness; and (b) loneliness has itself been linked to an increased risk for morbidity and mortality among older persons. [18,19]

The aim of the present study was to assess the urinary incontinence, mental health and loneliness among community-dwelling older adults.

Materials and Methods

The present study was conducted Department of Urology, AIIMS, Patna, Bihar, India for one year. In brief, TILDA was a nationally representative survey of community-based adults aged 50 and above. The target sample included every household resident meeting this age criterion. 200 patients were included in the study. In the current study, the analysis was restricted to participants aged 50 years and above and those who completed the self-completion questionnaires (SCQ). Individuals who were institutionalized and those who had doctor-diagnosed dementia were excluded. If severe cognitive impairment (judged at the interviewer's discretion) prevented individuals from providing written informed consent to participate in the survey, they were also excluded. The data was collected by trained interviewers using computer-assisted personal interviewing (CAPI), and with the use of self-completion questionnaires (SCQs). All individuals that underwent a CAPI interview were also asked to complete the SCQ.

Measures

Loneliness (Dependent variable)

The short form of the University of California, Los Angeles (UCLA) Loneliness Scale was used to assess feelings of loneliness. [20,21] The short form UCLA Loneliness Scale, which assesses subjective feelings of social isolation, is a commonly used measure in loneliness research. The dominant factor underlying the UCLA Loneliness scale is ‘perceived social isolation’. [22,23] The UCLA three-item scale is comprised of three negatively-worded questions relating to feelings of isolation, feeling left out and companionship. The three response options are coded as 1 (hardly ever), 2 (some of the time), and 3 (often). Scores are summed to create a total score that runs from 3 to 9, with higher scores indicating a greater degree of loneliness (Cronbach's alpha = 0.81). Previous research has indicated that this scale has an acceptable degree of reliability and has both concurrent and discriminant validity.²¹ As the distribution of the loneliness variable was right-skewed, in this study we used a dichotomous loneliness variable for the regression analyses. Specifically, in accordance with a recent study, a score of 4–9 was categorized as feeling lonely while a score of 3 (i.e., replying ‘hardly ever’ to all of the questions) was classified as not feeling lonely. [24]

Urinary incontinence (UI) (Independent variable)

Any UI was assessed by the question ‘During the last 12 months, have you lost any amount of urine beyond your control?’ with the answer options ‘yes’ or ‘no’. For those who responded affirmatively to this question, follow-up questions on the frequency of UI and limitations in activity due to UI were asked. Frequency was assessed by the question ‘Did this happen more than once during a 1 month period?’ and activity limitations were examined by the question ‘Do you ever limit your activities, for example, what you do or where you go, because of UI?’ Both of these questions had ‘yes’ or ‘no’ as answer options.

Depression

Depressive symptoms were measured with the 20-item Center for Epidemiologic Studies Depression (CES-D) scale [25], which assesses symptoms experienced in the preceding week. Its 20 items are scored on a scale from 0 (rarely or none of the time, less than one day in the week) to 3 (most or all of the time, five to seven days in the week). In order to avoid an overlap with the out-come (loneliness), and following the lead of an earlier study [26], we excluded the item on loneliness (‘I felt lonely’) that is included in the CES-D scale. Thus, scores from the remaining 19 items were summed to create a scale with values ranging from 0 to 57 where higher scores signified more depressive symptoms (Cronbach's alpha = 0.87). Previous studies have highlighted the validity of the CES-D scale as a measure of depression in community-dwelling older adults. [27,28]

Anxiety

The Hospital Anxiety and Depression Scale (HADS-A) [29] was used to assess anxiety symptoms. This scale measures the presence of anxiety symptoms without reference to a specific time frame. The scale consists of seven items rated on a four-point scale from 0 (not at all) to 3 (very often indeed), five of which are reverse coded. The scores from the individual items were summed to create a total score that ranged from 0 to 21, with higher scores indicating more anxiety (Cronbach’s alpha = 0.65). Previous research has indicated that the HADS is a reliable measure in both younger and older persons. [30]

Control variables Social network index

The Berkman-Syme Social Network Index (SNI) was used to assess social networks. The SNI is a validated self-report questionnaire [31] that assesses the degree to which a person is socially integrated. Information is elicited on marital/partnership status (married/with partner versus not), sociability (number of children, close relatives, and close friends and the frequency of contact with them), and church group or community organization membership. A composite score is calculated that ranges from 0 to 4. In this study, we used what is regarded as the standard categorization [i.e., 0–1 (most isolated), 2 (moderately isolated), 3 (moderately integrated), and 4 (most integrated)]. [31] Further information on the psychometric properties of the SNI and evidence relating to its predictive validity has been provided elsewhere. [32]

Chronic medical conditions

To assess chronic health conditions, participants were presented with a list of 17 medical conditions and asked, “has a doctor ever told you that you have any of the conditions on this card?” These conditions were: high blood pressure or hypertension; angina; heart attack (including myocardial or coronary thrombosis); congestive heart failure; diabetes or

high blood sugar; stroke (cerebral vascular disease); ministroke or transient ischemic at- tack; high cholesterol; heart murmur; abnormal heart rhythm; any other heart trouble; chronic lung disease such as chronic bronchitis or emphysema; asthma; arthritis (including osteoarthritis, or rheumatism); osteoporosis; cancer or a malignant tumor (including leukemia or lymphoma but excluding minor skin cancers); cirrhosis or serious liver damage. The total number of chronic medical conditions was calculated and divided into three categories: 0 (none), 1, or ≥2.

Activities of daily living (ADL) disability

To assess ADL disability participants were asked to indicate whether they had difficulty performing six activities (dressing, walking, bathing, eating, getting in or out of bed, and using the toilet).³³ Participants having difficulty with one or more ADLs were categorized as having an ADL disability.

Sociodemographic variables

Sociodemographic characteristics included age (50–59, 60–69, 70–79, and ≥80 years), sex, education, and wealth. Education was divided into three categories: primary (some primary/not complete; primary or equivalent); secondary (intermediate/junior/group certificate or equivalent; leaving certificate or equivalent); and tertiary (diploma/certificate; primary degree; postgraduate/higher degree). As more than 50% of the income values were missing, a proxy measure (financial strain) was used to assess wealth. Participants were thus asked to respond to the statement that a ‘shortage of money stops me from doing the things I want to do’ using one of the answer options, ‘never’, ‘rarely’, ‘sometimes’, and ‘often’.

Statistical Analysis

Stata version 14.1 (Stata Corp LP, College Station, Texas) was used to perform the analysis.

Results

Table 1: Baseline characteristics

Characteristic	Categories	Overall	Urinary incontinence		P-value
			No	Yes	
Age (years)	50–59	80	20	60	<0.001
	60–69	60	15	45	
	70–79	40	15	25	
	≥80	20	10	10	
Sex	Male	95	25	70	<0.001
	Female	105	35	70	
Education	Primary	75	25	50	<0.001
	Secondary	85	30	55	
	Tertiary	40	5	35	
Financial strain	Never	45	20	25	<0.001

	Rarely	40	15	35	
	Sometimes	70	23	47	
	Often	5	2	3	
Number of chronic conditions	None	50	20	30	<0.001
	One	55	30	25	
	Two or more	95	10	85	
ADL disability	No	180	50	130	<0.001
	Yes	20	10	10	
Social Network Index	Most isolated	15	5	10	0.011
	Moderately isolated	55	25	30	
	Moderately integrated	80	20	60	
	Most integrated	50	10	40	
Depression	Mean (SD)	5.7 (6.8)	5.2 (6.4)	9.1 (8.6)	<0.001
Anxiety	Mean (SD)	5.5 (3.7)	5.3 (3.6)	6.7 (4.1)	<0.001

Majority of the patients was belonged to the age groups 50-59 years and 52.5% were females in the study. 42.5% had secondary education level and 47.5% had chronic conditions more than two. 40% were moderately integrated.

Table 2: Association between urinary incontinence (independent variable) and loneliness (dependent variable) estimated by logistic regression

Characteristic	Categories	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Urinary incontinence	No	Ref	Ref	Ref	Ref	Ref	Ref
	Yes	1.72 [1.49,2.05]	1.52 [1.27,1.78]	1.53 [1.27,1.80]	1.22 [1.00,1.43]	1.26 [1.06,1.53]	1.16 [0.94,1.37]
Age (years)	50-59		Ref	Ref	Ref	Ref	Ref
	60-69		0.96 [0.83,1.08]	1.05 [0.90,1.17]	1.15 [0.99,1.30]	1.23 [1.06,1.41]	1.26 [1.10,1.46]
	70-79		1.18 [1.01,1.40]	1.32 [1.10,1.53]	1.44 [1.20,1.70]	1.75 [1.46,2.07]	1.77 [1.47,2.10]
	≥80		1.45 [1.13,1.88]	1.38 [1.05,1.77]	1.55 [1.17,1.99]	2.07 [1.56,2.70]	2.08 [1.56,2.72]
Sex	Male		Ref	Ref	Ref	Ref	Ref
	Female		1.14 [1.01,1.24]	1.11 [1.00,1.22]	0.96 [0.88,1.08]	0.94 [0.83,1.03]	0.88 [0.78,0.98]
Education	Primary		Ref	Ref	Ref	Ref	Ref
	Secondary		0.94 [0.82,1.09]	1.05 [0.89,1.19]	1.08 [0.92,1.24]	1.09 [0.92,1.25]	1.09 [0.93,1.27]
	Tertiary		0.92 [0.80,1.07]	1.04 [0.90,1.21]	1.11 [0.95,1.29]	1.13 [0.96,1.32]	1.15 [0.98,1.35]
Financial strain	Never		Ref	Ref	Ref	Ref	Ref
	Rarely		1.36 [1.18,1.62]	1.40 [1.20,1.66]	1.42 [1.21,1.70]	1.22 [1.02,1.43]	1.25 [1.04,1.48]
	Sometimes		1.86 [1.63,2.16]	1.87 [1.63,2.17]	1.81 [1.55,2.09]	1.52 [1.32,1.79]	1.52 [1.32,1.81]
	Often		3.67 [3.03,4.42]	3.36 [2.77,4.06]	2.68 [2.17,3.26]	2.16 [1.75,2.61]	1.98 [1.61,2.45]
Number of Chronic conditions	None		Ref	Ref	Ref	Ref	Ref
	One		1.02 [0.86,1.18]	1.03 [0.89,1.22]	1.04 [0.87,1.20]	1.05 [0.87,1.22]	1.03 [0.87,1.21]
	Two or more		1.25 [1.07,1.43]	1.26 [1.07,1.44]	1.16 [0.99,1.34]	1.14 [0.96,1.31]	1.09 [0.93,1.27]
ADL disability	No		Ref	Ref	Ref	Ref	Ref

	Yes		1.16	1.07	0.75	0.95	0.72
			[0.93,1.39]	[0.87,1.31]	[0.59,0.92]	[0.75,1.18]	[0.60,0.97]
Social Network	Mostly isolated			Ref	Ref	Ref	Ref
Index	Moderately isolated			0.58	0.62	0.61	0.63
				[0.45,0.77]	[0.47,0.83]	[0.45,0.80]	[0.46,0.84]
	Moderately integrated			0.43	0.48	0.43	0.44
				[0.31,0.52]	[0.35,0.60]	[0.30,0.52]	[0.32,0.57]
	Most integrated			0.25	0.32	0.27	0.29
				[0.20,0.34]	[0.23,0.40]	[0.19,0.33]	[0.21,0.37]
Depression	(per one-unit increase)				1.12		1.07
					[1.09,1.11]		[1.05,1.07]
Anxiety	(per one-unit increase)					1.25	1.22
						[1.21,1.26]	[1.17,1.22]

In the unadjusted model, the OR (95% CI) was 1.74. This was attenuated when the model was adjusted for sociodemographic factors, chronic conditions, and ADL disability but remained statistically significant. Further adjustment for the SNI had little effect on the association. The OR became non-significant when depression was included in the model but not when anxiety was included.

Table 3: Association between frequency of urinary incontinence or activity limitations due to urinary incontinence (independent variables) and loneliness (dependent variable) estimated by logistic regression with no urinary incontinence as the reference category

Characteristic	Categories	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Frequency of	No urinary incontinence	Ref	Ref	Ref	Ref	Ref	Ref
Urinary incontinence	Once a month or less	1.64	1.52	1.55	1.34	1.26	1.22
		[1.20,2.20]	[1.08,2.07]	[1.09,2.14]	[0.94,1.90]	[0.88,1.78]	[0.85,1.74]
	More than once a month	1.80	1.52	1.54	1.17	1.28	1.14
		[1.49,2.15]	[1.24,1.83]	[1.25,1.84]	[0.94,1.42]	[1.04,1.59]	[0.90,1.38]
Activity limitations	No urinary incontinence	Ref	Ref	Ref	Ref	Ref	Ref
Due to urinary incontinence	No activity limitations	1.55	1.38	1.39	1.15	1.19	1.07
		[1.28,1.84]	[1.12,1.64]	[1.12,1.67]	[0.92,1.39]	[0.94,1.43]	[0.86,1.32]
	Activity limitations	2.62	2.08	2.09	1.48	1.72	1.43
		[1.91,3.55]	[1.51,2.84]	[1.50,2.88]	[1.03,2.05]	[1.20,2.45]	[0.98,2.04]

When the frequency of UI or activity limitations due to UI were taken into account, compared to no UI, having activity limitations due to UI was associated with particularly high odds for loneliness even in models adjusted for either depression or anxiety (Model 4 and 5) although the OR was no longer

significant when depression and anxiety were included simultaneously in the model (Model 6). Frequency of UI was not as strongly associated with loneliness as activity limitations due to UI and became non-significant in the models where depression and anxiety were included.

Table 4: Association between frequency of urinary incontinence or activity limitations due to urinary incontinence (independent variables) and loneliness (dependent variable) restricted to individuals with urinary incontinence estimated by logistic regression

Characteristic	Categories	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Frequency of	Once a month or less	Ref	Ref	Ref	Ref	Ref	Ref
Urinary incontinence	More than once a month	1.11	0.98	0.97	0.88	1.05	0.94
		[0.78,1.56]	[0.69,1.43]	[0.68,1.44]	[0.59,1.29]	[0.71,1.54]	[0.61,1.36]
Activity limitations	No activity limitations	Ref	Ref	Ref	Ref	Ref	Ref
Due to urinary	Activity limitations	1.72	1.55	1.56	1.32	1.52	1.36
Incontinence		[1.20,2.41]	[1.05,2.20]	[1.06,2.24]	[0.87,1.93]	[1.00,2.28]	[0.88,2.04]

In the analysis restricted to those with UI, a higher frequency of UI was not associated with elevated odds for loneliness, but activity limitations due to UI were associated with significantly higher odds for loneliness in all models except those which adjusted for depression.

Discussion

Urinary incontinence (UI), which is defined as the involuntary leakage of urine [34] is highly prevalent in the general population and can severely affect many aspects of daily life. [35,36] Although this condition can exist in adults of all ages, a large body of research has shown that the prevalence of UI increases with age [37,38] and that the elderly are especially vulnerable to this condition [39] particularly in a severe form. [40,41] While previously reported prevalence figures vary due to the different operational definitions of UI employed (type, severity etc.), an earlier review article presented figures which showed that the prevalence of UI ranges between 9 and 59% in those aged 50 and above. [42]

Majority of the patients was belonged to the age groups 50-59 years and 52.5% were females in the study. 42.5% had secondary education level and 47.5% had chronic conditions more than two. 40% were moderately integrated. In the unadjusted model, the OR (95% CI) was 1.74. This was attenuated when the model was adjusted for sociodemographic factors, chronic conditions, and ADL disability but remained statistically significant. Further adjustment for the SNI had little effect on the association. The OR became non-significant when depression was included in the model but not when anxiety was included. Moreover, the results from the analyses examining UI severity also seem to support this idea as activity limitations were strongly associated with loneliness in the whole sample and when the analysis was restricted to those with UI. Being treated differently by other people because of their condition [43] might also act to isolate those with UI and lead to feelings of loneliness, especially as a recent study

from the United States has indicated that older women with daily UI often feel left out and that they lack companionship. [44] When the common mental disorder variables, in particular, depression, were entered into the analysis, however, the association between UI, UI severity and loneliness became non-significant. Together with our finding that those with UI are more likely to experience greater anxiety and depression, this suggests that poorer mental health might be an intervening variable between UI and loneliness. It can only be speculated what underlies the association between depression and loneliness among those with UI, as even though earlier research has indicated that they can both influence each other over time [45], as yet, there has been comparatively little research on the specific mechanisms linking depression to loneliness. [46]

When the frequency of UI or activity limitations due to UI were taken into account, compared to no UI, having activity limitations due to UI was associated with particularly high odds for loneliness even in models adjusted for either depression or anxiety (Model 4 and 5) although the OR was no longer significant when depression and anxiety were included simultaneously in the model (Model 6). Frequency of UI was not as strongly associated with loneliness as activity limitations due to UI and became non-significant in the models where depression and anxiety were included. In the analysis restricted to those with UI, a higher frequency of UI was not associated with elevated odds for loneliness, but activity limitations due to UI were associated with significantly higher odds for loneliness in all models except those which adjusted for depression. Specifically, a recent study has reported that a lower sense of mastery significantly contributes to the association between depression and (emotional) loneliness⁴⁶ while other research has indicated that UI is associated with a lower sense of mastery [47] and that there is an association between a poor sense of mastery and depression in those with UI. [48] One of the safety-seeking behaviors among those with UI – inquiring

frequently if he or she smells – might also be a factor that links depression and loneliness, as a more general connection has been shown to exist between seeking reassurance excessively and both depression and interpersonal rejection. [49,50]

Conclusion

UI is associated with higher odds for loneliness among older community-dwelling adults but this association is largely explained by comorbid mental health problems, in particular, depression. The results of this study and the detrimental (psychological/mental health) outcomes that have been reported in earlier studies, together with the fact that at least one-third of older adults with UI do not seek help, suggest that more effort is required to educate older respondents about this condition and its effects, as well as about the wide variety of treatment options that are available for it.

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