

# URINARY INCONTINENCE, DEPRESSION, AND PSYCHOSOCIAL FACTORS - A REVIEW OF POPULATION STUDIES

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## ABSTRACT

The psychological effects of urinary incontinence, such as psychological distress, depression, and anxiety are well recognised. Associations between incontinence, quality of life, and mental health have been demonstrated; however, research concerning incontinence and depression together, and the subsequent impact on health, quality of life, help-seeking, and other psychosocial factors, is limited. Examining associations between incontinence and psychosocial and mental health may provide an opportunity to address this health problem in a different way. A comprehensive review of the literature with regard to population studies in the area of urinary incontinence, psychosocial issues, and depression, as well as the interplay between these three concepts is presented, and the absence of research in this area is highlighted.

**Keywords:** Urinary incontinence, depression, psychosocial, population studies, epidemiology, review.

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## INTRODUCTION

The psychological effects of urinary incontinence, such as psychological distress, depression, and anxiety are well recognised<sup>1</sup> as Vigod et al.<sup>2</sup> have observed:

*“Regardless of how the two disorders are related, the combined impact of urinary incontinence and major depression exceeds the impact of either condition alone [...] Leaving either of these disorders undiagnosed and thus untreated will clearly have significant impact on the health and quality of life of individual patients and the population as a whole.”*

A review of studies addressing the combined effects of depression with any chronic condition found that there were further associations with a number of other problems. These included an increase in the use and cost of medical resources, amplification of physical symptoms, additive effects in the area of functional impairment, decreased compliance with treatment and lifestyle changes, and also increased mortality.<sup>3</sup> However, research concerning the combined effect of incontinence and depression, and the subsequent

impact on health, quality of life, help-seeking, and other psychosocial factors, is limited.<sup>4-8</sup>

Poor bladder control or leakage is termed ‘urinary incontinence’.<sup>9</sup> The International Continence Society takes great care in its definition of urinary incontinence to include that incontinence is involuntary leakage in the context of type, frequency, severity, precipitating factors, social impact, effect on hygiene, and quality of life.<sup>9</sup>

In Australia, the prevalence urinary incontinence for women >18 years old has previously been reported at 25.8%.<sup>10</sup> South Australian data from 1998 report a prevalence of 20.3% for adults ≥16 years old.<sup>11</sup> The most current South Australian data, unpublished from the South Australian Health Omnibus Survey (SAHOS) in 2004, give an overall prevalence of urinary incontinence at 28.0%.<sup>12</sup>

Associations between incontinence, quality of life, and mental health have been demonstrated, but exploration into the implications of this connection with regard to psychosocial factors is necessary and there has recently been a call for research in this area.<sup>1,5,13-17</sup> Furthermore, little

research around psychosocial factors has considered men with incontinence and depression. Examining associations between incontinence and psychosocial and mental health may provide an opportunity to address this health problem in a different way. The treatment or management of symptoms can make a significant difference to the impact on individual quality of life and carers of people with incontinence, as well as the whole health system.<sup>10,18,19</sup>

There are a number of factors which contribute to the difficulty of studying incontinence and depression epidemiologically. These include the various definitions of the diagnosis for both incontinence and depression, different epidemiological methods used to estimate prevalence in the community, and the underreporting of these conditions due to stigma or perceptions of those experiencing the condition. However, this review intends to critically analyse these problems within each of the studies presented, so that a clearer picture of the conditions and outcomes studied may be obtained.

Methodologically, prevalence data considering an individuals' self-reporting of illness and disease are most accurately collected using community based population surveys,<sup>20</sup> and this review has sought to include these. Samples derived from clinical populations only consider those members of the community who realise or acknowledge they have a problem and seek medical assessment, excluding the majority of the community who, for various reasons, have not accessed such care. Cross-sectional studies, as reported in this review, are not able to infer causality or accurately define the chronology of events for the development of co-morbidities, depression, and psychosocial factors that can be associated with incontinence.

The aim of this review is to provide a comprehensive discussion of the literature with regard to incontinence related psychosocial issues and depression, as well as the interplay between these concepts. Key studies regarding urinary incontinence and depression will be discussed. Finally, the absence of research in this area will be highlighted.

## METHODS

### Search Strategy

A systematic search of the literature, using the keywords 'incontinence', 'AND', and 'depression'

carried out between 2005–2014, identified articles written in English using PubMed. Articles were also mainly limited to those published in 1990, going back 25 years. Once articles were identified, individual reference lists derived from these were also hand-searched to discover additional articles. A number of automatic alerts were also used over the period to identify useful papers.

## RESULTS: URINARY INCONTINENCE AND DEPRESSION

The association between incontinence and depression has been demonstrated in several studies.<sup>1,5,13-17,21</sup> Of those self-reporting urinary incontinence, 20.5% also scored for other symptoms or major depression on the Primary Care Evaluation of Mental Disorders-Patient Health Questionnaire (PRIME-MD PHQ) scale, and 1.6-times more people with urinary incontinence experienced depression than those without incontinence.<sup>21</sup> Clearly, if someone is incontinent, they may become depressed, particularly if it affects their quality of life. However, other explanations proposed for the relationship between urinary incontinence and depression include biochemical models, such as that in experimental animals, where lowering monoamines such as serotonin and noradrenaline in the central nervous system (CNS) leads to depression and increased urinary frequency and a hyperactive bladder.<sup>22</sup> Depression may not only be a result of persistent urinary incontinence, but individuals with altered monoamines in the CNS could manifest both depression and an overactive bladder.<sup>23</sup>

The prevalence of depression in those experiencing urinary incontinence has been consistent across many studies and is similar for both clinically based studies and population surveys internationally.<sup>24,25</sup> Some studies determine actual prevalence, some quote mean scores from depression scales, and others allude to a higher risk of depression in the incontinent population, when compared with the general population.<sup>26,27</sup>

Clinical studies include research where the sample is derived from a clinic, hospital, or practice where the respondents may already be receiving treatment for incontinence, or for other medical problems, such as in gynaecological or menopause clinics, or even general practice. Studies in this area have generally had a small sample size, and are not useful for determining the overall population prevalence of incontinence. However, diagnosis of

the specific type of urinary incontinence is usually medically verifiable in these situations, instead of relying on self-report. Various instruments have been used to determine depression in those with urinary and anal incontinence, from self-assessment to psychiatric evaluation. We have not addressed clinical studies in this review.

Population studies regarding incontinence and depression have, in general, examined a higher number of cases leading to greater statistical power, and have also identified a greater number of people who have not been diagnosed with, received treatment, or even sought help for either of these conditions. However, the majority of these studies have only examined women or the older population.

Some studies comment only on the statistical associations between incontinence and depression, and these have been included. Reviews of the literature for each area have also been commented upon. Population studies in urinary incontinence and depression concerning both men and women have been summarised in [Table 1](#) and for women only in [Table 2](#).

## Population Studies: Men and Women

### Telephone Interviews

Two computer assisted telephone interviewing (CATI) surveys from the USA have determined the prevalence of depression in respondents with urinary incontinence. One of the studies found that in those aged  $\geq 40$  years, 20.6% of respondents with urinary incontinence self-reported feeling depressed.<sup>28</sup> The other study, using a screening questionnaire for depression in older respondents aged  $\geq 60$  years, found that 43.0% of respondents with urinary incontinence had depression, and this occurred in 24.0% of men and 38.0% of women.<sup>24</sup>

To determine associations of depression in men and women with urinary incontinence, a number of population studies have used the Center for Epidemiologic Studies Depression Scale (CES-D), with a cut-off score of  $\geq 16$ . One American study administering the CES-D via CATI to adults  $\geq 53$  years old found a statistically significant association between depression and urinary incontinence.<sup>28</sup> A third American study, this time including younger adults aged  $\geq 18$  years, using the CES-D in CATI interviews, had a similar statistically significant finding.<sup>26</sup>

### Face to Face Interviews

A study from Korea using the CES-D looked at incontinence and depression with quality of life but did not look at the prevalence of these in combination, and did discover that lower urinary tract symptoms (LUTS) and depression were the principal predictors of quality of life in older adults.<sup>29</sup> A recent Australian study looked at the associations between incontinence, depression, and quality of life and observed urinary incontinence with comorbid depression in 4.3% of the overall population, aged  $\geq 15$  years. The interaction of the presence of incontinence and the presence of depression was significantly associated with the dimensions of physical functioning on the Short Form (SF-36).<sup>21</sup>

### Mixed Methods Population Studies

Research utilising a combination of face to face and telephone interviews included a study of African Americans in the USA aged 52-68 years, which found a prevalence of depression in those with incontinence of 38.8%.<sup>30</sup> An Australian study of those aged  $\geq 65$  years showed that women with any incontinence had a higher negative affect, and that men with stress urinary incontinence also had a higher negative affect.<sup>27</sup>

### Internet Panels

Increasingly, some of the more recent studies have made use of population panels where participants are able to answer questionnaires over the internet. One such study, known as the EpiLUTS from the US, UK, and Sweden that interviewed 30,000 men and women aged  $\geq 40$  years, found that men and women with multiple LUTS reported the lowest levels of urinary-specific quality of life and generic health, and had the highest rates of clinical anxiety and depression,<sup>31</sup> as well as observing that men with mixed urinary incontinence had the highest prevalence of depression (42.1%), and women with stress urinary incontinence plus other incontinence had a prevalence of depression of 34.9%.<sup>32</sup>

## Population Studies: Women

### Face to Face Interviews

International population studies considering women only include three studies from the USA that used the CES-D to determine the prevalence of depression in people with urinary incontinence.

**Table 1: Urinary incontinence and depression studies – men and women.**

Author	Country	Participants n/N Age (years)	Survey Setting	Incontinence definition/ instrument	Depression definition/ instrument	Prevalence/Results
<b>Urinary – Population Studies – Women and Men – Telephone</b>						
Dugan E et al. (2000) <sup>24</sup>	North Carolina, USA	230/668 ≥60	Community residents RCT of primary care practices: CATI survey	Self-report, past 3 months, severity	Screeners for depression	UI 52.5% <b>D &amp; UI 43.0%</b> D & UI (W) 38.0% D & UI (M) 24.0%
Fultz N et al. (2001) <sup>8</sup>	Michigan, USA	206/1,322 ≥40	CATI, population study	Self-report, past 6 months, severity	Self-report past week	UI 15.6% <b>D &amp; UI 20.6%</b>
Stewart WF et al. (2003) <sup>26</sup>	Baltimore, USA	538/5,204 ≥18	CATI, population study	OAB, UI, self-report	SF-36 CES-D	OAB 16.5% OAB & UI 6.1% OAB & D SS Higher CES-D scores
Fultz NH et al. (2005) <sup>28</sup>	Michigan, USA	?/4987 ≥53	CATI, population study	Self-report, last month	CES-D	UI (W) 21.0% UI (M) 6.0% SS associated with dep
Irwin DE et al. (2006) <sup>25</sup>	France, Germany, Italy, Spain, Sweden, UK	1,272/11,521 40–64	CATI cross-sectional population-based survey (Spain direct interviews)	OAB with UI (frequency, urgency, urge incontinence, or nocturia) Self report, past 12 months	Asked about the negative impact associated with OAB symptoms on emotional well-being	OAB with UI & D 39.8%
<b>Urinary – Population Studies – Women and Men – Face to Face</b>						
Bogner HR et al. (2004) <sup>13</sup>	Baltimore, USA	747 ≥50	As above analysis by race	Self-report, past 12 months	Psychological distress (PD) GHQ score ≥4 for caseness	UI 20.0% PD & UI 28.5% As above
Song et al. (2012) <sup>29</sup>	Jeju, Korea	171 61–94	Cross-sectional, face to face	Involuntary urine loss once per month or more frequent past 6 months	Korean CES-D	D = 18.6% UI = 22.2% (no combination – only looked at QoL)
<b>Urinary – Population Studies – Women and Men – Mixed Methods</b>						
Malstrom TK et al. (2010) <sup>30</sup>	Missouri, USA	853 African Americans 52–68	Cross-sectional in home and CATI	Self-report, past 12 months	CES-D	UI 12.1% <b>D &amp; UI 38.8%</b>
Sims et al. (2011) <sup>27</sup>	Melbourne, Australia	796 ≥65	Cohort study, face to face/ CATI	Self-report: Ever accidentally passed urine, urgency question	Psychogeriatric assessment scales	UI 28.0% SUI 21.0% W UI Higher negative affect M SUI Higher negative affect
<b>Urinary – Population Studies – Women and Men – Internet Panels</b>						
Coyne et al. (2009) <sup>31</sup>	USA, UK, Sweden	30,000 ≥40 Mean M = 53.9 Mean W = 60.3	EpiLUTS Cross-sectional population study via internet panels	PPBC OAB-q SF	HADS	D M 29.8% D W 37.6% M and W with multiple LUTS reported the lowest levels of urinary-specific HRQL and generic health, and had the highest rates of clinical anxiety and depression

Table 1 continued.

Author	Country	Participants n/N Age (years)	Survey Setting	Incontinence definition/ instrument	Depression definition/ instrument	Prevalence/Results
<b>Urinary – Population Studies – Women and Men – Internet Panels</b>						
Coyne et al. (2012) <sup>32</sup>	USA, UK, Sweden	30,000 ≥40 Mean M =53.9 Mean W =60.3	EpiLUTS Secondary analysis of cross- sectional population study via internet panels	PPBC OAB-q SF	HADS	UI M 45.8% UI W 67.6% M: D highest with MUI (42.1%), D & UUI plus OUI (33.8%), D & SUI plus OUI (31.5%). W: D highest with SUI plus OUI (34.9%), D & MUI (34.7%)

UI: urinary incontinence; UUI: urge urinary incontinence; SUI: stress urinary incontinence; MUI: mixed urinary incontinence; OUI: overflow urinary incontinence; LUTS: lower urinary tract symptoms; EpiLUTS: Epidemiology of LTUS; OAB: overactive bladder; OAB-q SF; OAB questionnaire short form; D: depression; PD: psychological distress; W: women; M: men; SS: statistically significant; PPBC: patient perception of bladder condition; HADS: hospital anxiety and depression scale; GHQ: general health questionnaire; CES-D: Center for Epidemiologic Studies Depression Scale; RCT: randomised controlled trial; CATI: computer assisted telephone interviewing; QoL: quality of life; HRQL: health-related quality of life.

Prevalence of D and UI highlighted in **BOLD**.

The first of these studies interviewed women aged 50–69 years and found a prevalence of depression of 14.2% in those with mild urinary incontinence, and 22.3% in those with severe urinary incontinence.<sup>33</sup> The second study found a prevalence of depression of 24.0% for women aged ≥70 years, with urinary incontinence occurring less than weekly, and 35.6% in those who were incontinent more than once a week. In those with urge urinary incontinence, the prevalence of depression was 12.0%, and 9.0% in those with stress urinary incontinence.<sup>34</sup> A third study found the prevalence of incontinence with depression to be 11.0% and although major depression predicted onset of urinary incontinence in a population-based sample of at-risk, community-dwelling women, incontinence did not predict onset of depression.<sup>35</sup> A further study from the USA looked at depression symptoms in women aged 30–79 years and found that urinary incontinence was associated with depression symptoms.<sup>36</sup>

### Telephone

A Canadian CATI study undertaken with 69,000 women aged ≥18 years found the prevalence of major depression in those with urinary incontinence to be 15.5%, which was significantly higher than the prevalence in women without incontinence.<sup>2</sup> Another CATI study concerning women aged

>52 years who were veterans, found a prevalence of stress urinary incontinence and depression using the Composite International Diagnostic Interview (CIDI) to be 32.8%, and urge or mixed incontinence at 43.5%.<sup>37</sup>

### Mailed Questionnaires

One of the only Australian population studies concerning urinary incontinence and depression considered women only. The study was part of the ongoing Women's Health Australia (WHA) project, where over 40,000 women between the ages of 18 and 75 years filled out postal questionnaires regarding their health, of which questions regarding incontinence, as well as the SF-36 were included.<sup>38</sup> Respondents with urinary incontinence had lower scores on the Mental Component Summary (MCS) of the SF-36 than those without incontinence, and the youngest group had a mean score of 40.7, where a score of ≤42 on the MCS indicates clinical depression.<sup>39</sup>

One American study using the Beck Depression Inventory (BDI) through a mailed questionnaire, to detect depression (score >13) in women aged 27–90 years with urinary incontinence, found a prevalence of 22.0%, where the incidence of depression in the general population using this instrument is 6.0%.<sup>40</sup> Another study using the CES-D in a mailed questionnaire, found statistically



significant higher scores for depression in women aged  $\geq 60$  years with urinary incontinence across time.<sup>16</sup>

Another American study, using the PRIME-MD PHQ in women aged 30–90 years, found a prevalence of major depression of 6.1% in women with urinary incontinence, with a rate of 3.7% in the general sample.<sup>41,42</sup>

A further study from Sweden examining women by mailed questionnaires that asked for self-reports of feeling ‘down’ and ‘blue’ to determine depression, observed that depression in women aged 50–64 years was statistically significantly associated with urinary incontinence.<sup>43</sup>

In the UK, a study showed that in women  $\geq 40$  years of age, the prevalence of urinary incontinence with depression using the Hospital Anxiety and Depression Scale (HADS)<sup>44</sup> was 38.0%.<sup>45</sup> Similarly in the Netherlands, women aged 20–70 years had a prevalence of incontinence with depression of 42.8%, but urinary incontinence was not found to be a risk factor for depression.<sup>46</sup> In a study of women aged 40–44 years in Norway using the HADS, the prevalence of incontinence with depression was 11.8%.<sup>47</sup> The Nurses’ Health Study in the USA also examined incontinence with depression. Overall they found a prevalence of

28.9%,<sup>48</sup> and when split, more frequent urinary incontinence and greater severity were significantly associated with higher prevalence of high depressive symptoms in both black and white women.<sup>49</sup>

## Internet Panels

One women’s study was a twin study undertaken via the internet and this found the rate of incontinence with depression to be 11.8%.<sup>50</sup>

## Reviews

Reviews of the literature regarding the association between urinary incontinence and depression have been completed. An earlier American review concentrated on articles from the 1980s (outside the scope of our review) that name psychological distress and depression as outcomes of urinary incontinence, and provided reasons why this may be the case.<sup>9</sup> Other more recent reviews of this topic have discussed the psychological impact of incontinence and the management of the associated psychological morbidity,<sup>51</sup> the psychosocial and societal burden of incontinence (particularly in the aged<sup>52</sup>), the cognitive barriers and safety-behaviours involved in the development and maintenance of emotional distress in patients with urinary incontinence,<sup>53</sup> and the quality of life in people with incontinence particularly looking at anxiety and depression.<sup>54</sup>

**Table 2: Urinary incontinence and depression studies – women only.**

Author	Country	Participants n/N Age (years)	Survey Setting	Incontinence definition/ instrument	Depression definition/ instrument	Prevalence/Results
<b>Urinary – Population Studies- Women – Face to Face</b>						
Nygaard I et al. (2003) <sup>33</sup>	Iowa, USA	905/5,701 50–69	Population based face to face	Self-report	CES-D $\geq 16$ CIDI	UI 16% <b>D &amp; UI<sup>mild</sup> 14.2%</b> <b>D &amp; UI<sup>sev</sup> 22.3%</b>
Jackson RA et al. (2004) <sup>34</sup>	Pennsylvania & Tennessee, USA	1,558 70–79	Health ABC Longitudinal cohort study	Self-report, Frequency (d, weekly, <weekly) Used $\geq$ weekly	CES-D $>15$	D & UI <weekly 24.0% D & UI $\geq$ weekly 35.6% D & UUI 2.0% D & SUI 9.0%
Melville JL et al. (2009) <sup>35</sup>	Michigan, USA	5,820 Mean 59.3	HRS Longitudinal cohort interviews	Self-report past year	CES-D CIDI-SF	<b>D &amp; UI 11.0%</b> <b>D &amp; UI 18.0%</b> Major depression predicted onset of UI in a pop- based sample of at-risk, community-dwelling women. UI did not predict depression
Maserejian NN et al. (2014) <sup>36</sup>	Boston, USA	3,201 30–79	Boston Area Community Health Survey, obs cohort	Self-report and treatment status, monthly, weekly.		UI at baseline, persistence was associated with depression symptoms (monthly UI) OR=2.39

**Table 2 continued.**

Author	Country	Participants n/N Age (years)	Survey Setting	Incontinence definition/ instrument	Depression definition/ instrument	Prevalence/Results
<b>Urinary – Population Studies- Women - Telephone</b>						
Vigod SN et al. (2006) <sup>2</sup>	Canada	69,003 ≥18	Canadian Community Health Survey Population Study, CATI	Do you suffer from urinary incontinence?	CIDI-SF CCHS HUI III	UI 3.23% D 9.4% <b>D &amp; UI<sup>(maj D)</sup> 15.5%</b> <b>Younger &amp; increased risk (30%).</b>
Bradley et al. (2012) <sup>37</sup>	Iowa, USA	968 ≥52 Mean 38.7	Secondary analysis of veterans, CATI	Self-report	CIDI-SF	SUI 18.9% MUI 16.2% UUI 3.5% D & SUI 32.8% UUI/MUI & D 43.5%
<b>Urinary – Population Studies- Women - Mailed</b>						
Chiverto PA et al. (1996) <sup>40</sup>	New York, USA	125 27-90	Community residents, mailed questionnaire	Self-report: Uncontrolled urine loss Excessive day toileting frequency	BDI ≥13	<b>D &amp; UI 22.0%</b>
Chiarelli P et al. (1999) <sup>38</sup>	Newcastle, Australia, Australia wide study	?/41,724 18-75	Australian Longitudinal Study on Women's Health: cohort study, mailed	Self-report	SF-36	UI by age group 12.8%, 36.1%, 35.0% Lower scores on MCS and PCS
Heidrich SM et al. (2004) <sup>16</sup>	Wisconsin, USA	26/103 >60	Longitudinal study, community dwelling, mailed questionnaire	Self-report	Bradburn Affect Balance Scale CES-D ≥15	UI 25.0% <b>D &amp; UI</b> <b>Over time SSH D scores</b>
Melville JL et al. <sup>41,42</sup>	Washington, USA	1,458/3,438 30-90	Population based mailed generic questionnaire	Leakage at least monthly	PRIME-MD HQ	UI 45.0% <b>D &amp; UI 6.1%</b>
Melville JL et al. <sup>41,42</sup>	Washington, USA	1,458/3,536 30-90	Population based mailed generic questionnaire	Leakage at least monthly Major Depression	PRIME-MD HQ	UI 45.0% <b>D &amp; UI<sup>(maj D)</sup> 6.1%</b>
Moghaddas et al. (2005) <sup>43</sup>	Lund, Sweden	2,145/6,642 50-64	Population based mailed generic questionnaire and lab exam	Self-report occurrence of UI plus severity	Generic questionnaire: self-report feeling down and blue	UI 31.0% D 52.0% <b>D &amp; UI SSH</b>
Perry S et al. (2006) <sup>45</sup>	Leicester & Rutland, UK	12,568 ≥40	Leicestershire MRC Incontinence Study, long postal survey	Self-report	HADS	UI 15.3% D 20.3% <b>D &amp; UI 38%</b> UUI & D 37.6%
Van der Vaart et al. (2007) <sup>46</sup>	Utrecht, Netherlands	2,042 20-70	Population based, mailed questionnaires	UDI	CES-D	UI 51.1% <b>D &amp; UI 42.8%</b> (UI not a risk factor for D)
Felde G et al. (2012) <sup>47</sup>	Hordaland, Norway	5,321 40-44	HUSK population study, Mailed questionnaire	Self-report	HADS	UI 26.2% D 10.8% <b>D &amp; UI 11.8%</b> D & UUI 11.7%
Matthews et al. (2013) <sup>48</sup>	Boston, USA	64,396	NHSMQ	Self-report	History of D dx or anti-D medication use or a score >5 on Geriatric Dep Scale	UI 37.8% <b>D &amp; UI 28.9%</b>

Table 2 continued.

Author	Country	Participants n/N Age (years)	Survey Setting	Incontinence definition/ instrument	Depression definition/ instrument	Prevalence/Results
Urinary – Population Studies- Women - Mailed						
Townsend MK et al. (2014) <sup>49</sup>	Boston, USA	72,000 58–83 Mean 70	NHSMQ	Self-report	CES-D	UI black 30.9% D black 13.7% UI white 46.7% D white 16.3%
Urinary – Population Studies- Women - Internet Panels						
Tettamanti et al. (2014) (Tettamanti et al. [2013]) <sup>50</sup>	Stockholm, Sweden	42,852	STAGE Twin study, web based	Self-report	CES-D CIDI-SF	UI 7.0% D 23.8% <b>D &amp; UI 11.8%</b>

UI: urinary incontinence; UUI: urge urinary incontinence; SUI: stress urinary incontinence; MUI: mixed urinary incontinence; D: depression; dx: diagnosis; W: women; M: men; SS: statistically significant; SSH: statistically significantly higher; HRS: Health and Retirement Study; NHSMQ: Nurses’ Health Study Mailed questionnaire; d: daily; OR: overall response; CATI: computer assisted telephone interviewing; CIDI: composite international diagnostic interview; CES-D: Center for Epidemiologic Studies Depression Scale; MCS: mental component summary; PCS: physical component summary; HADS: Hospital Anxiety and Depression Scale; PRIME-MD HQ: Primary Care Evaluation of Mental Disorders-Patient Health Questionnaire; CCHS: congenital central hypoventilation syndrome; HUSK: Hordaland Health Study; UDI: urinary distress inventory; BDI: Beck Depression Index; HUI: Health Utilities Index. Prevalence of D and UI highlighted in **BOLD**.

CONCLUSION: GAPS IN THE RESEARCH

There is a paucity of research identifying associations between incontinence, psychosocial factors, and depression, with only two recent studies.<sup>17,21</sup> A number of studies had the potential to examine this relationship, but did not do so. One study found no significant relationship, and another examined an observational relationship, with no particular conclusions. The studies outlined above have been undertaken in both men and women, together and separately, using different methodologies and instruments in different country, cultural, and age groups. The majority of these studies also concentrate on older age groups with few considering the whole adult population.

Whenever possible, the prevalence of comorbid depression in the presence of urinary incontinence has been stated, and this has been reported here at anywhere between 6.0–43.0%. The gold standard methodologies, such as face to face population surveys, report a prevalence of 15.0–30.0% for women, depending on which scale was used, the age group, and the year. The studies described usually report a significantly higher rate of depression amongst those with incontinence.

Comparing the rates of depression in those with urinary incontinence with those of the overall population (ranging from 5.0–15.0% as discussed previously); we can estimate that the burden of depression in those with urinary incontinence is greater. Studies that include males report lower prevalence rates for urinary incontinence than for females; however, studies show conflicting results as to whether men may be more likely to experience depression when they have incontinence when compared with women. In order to determine that this is the case within different populations, we must undertake research that explores the difference in the prevalence of depression in those with and without urinary incontinence for both sexes using quality population studies and validated instruments, amongst all age groups.

Primarily, the studies reviewed here identified the presence of depression in conjunction with incontinence. They did not explore the burden on society or the healthcare costs associated with incontinence and comorbid depression. The psychosocial factors that are associated with incontinence may be adversely impacted upon by depression. Incontinent people experiencing



comorbid depression may be less likely to seek help for their incontinence, their quality of life may be lower, they may be more socially isolated, their perception of symptom severity may be greater, and their use of health services may be less when compared to individuals with incontinence who are not depressed.<sup>1,6,13-16</sup> For the 15–30% of those with incontinence who also suffer from depression, an opportunity to reduce the burden of incontinence is presented, as treating depression may be more successful than treating incontinence.<sup>8,23,55,56</sup> However, psychosocial barriers to treatment such as reduced help-seeking present a dilemma.

In both those with only incontinence and those with only depression, only 30–60% of these groups seek help. Incontinence costs at least

A\$200 million<sup>57</sup> and depression, >A\$20 billion,<sup>58</sup> representing a great economic burden on the community. It is unclear what impact the combination of these conditions has on society.

Both urinary incontinence and depression have an impact on quality of life.<sup>11,59</sup> However, this review has shown that little recent research has considered the association between incontinence and psychosocial factors, such as help-seeking and quality of life, with depression. We have, however, recently found that when incontinence and depression are combined, they have a greater effect on psychosocial factors than when these conditions stand alone,<sup>21</sup> and further research in this area is warranted, particularly into interventions that are able to manage the symptoms of either condition.

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