

The impact of incontinence on health-related quality of life in a South Australian population sample

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Health outcomes, such as health related quality-of-life measurements, enable the functional costs of specific chronic diseases to be assessed against other illnesses.^{1,2} Comparisons can also be made with those who do not experience chronic conditions. Incontinence, a chronic condition without a glamorous reputation, can result in major disruption to many areas of life.³ Both urinary and anal incontinence have an impact on working and social life, undermining self-confidence and creating embarrassment and humiliation.^{4,5} Some incontinence is manageable,^{3,6-8} but more research in this area is needed.⁹ In an ageing population, such as that of South Australia, identification of the impact of this important but often overlooked public health issue may encourage policy development and resource allocation towards incontinence research.

The majority of incontinence population research has focused primarily on urinary incontinence and is often only concerned with middle to older-aged women,¹⁰ the group it most affects, or from other samples of convenience.¹¹⁻¹³ A recent Australian systematic review estimated the prevalence of urinary incontinence among women and men over 18 years to be 19.3% and 2.2% respectively.¹⁴ We have previously reported, using

this representative population survey, the prevalence of any type of urinary incontinence to be 35.3% for women and 4.4% for men.¹⁵ Urinary incontinence can be classified as stress or urge incontinence, and often as other types including overflow, functional, reflex and mixed incontinence.

Monetary costs per annum of urinary incontinence are estimated at \$A710.44 million. However, there are other more indirect and intangible costs, such as its effect on quality of life.¹⁰ Urinary incontinence often occurs physiologically as a result of other chronic conditions such as diabetes or multiple sclerosis,¹⁶ or due to mobility limitations in conditions such as arthritis or osteoporosis. Other major contributing factors include physiological changes or damage to the pelvic floor due to pregnancy and instrumental delivery,¹⁵ drug therapies^{18,19} and the menopause.²⁰ Urinary incontinence is often manageable with surgery or physiotherapy, but many do not seek help due to embarrassment, acceptance that it is a natural part of ageing,¹⁹ or fear of treatment.²²

The second major category of incontinence concerns anal incontinence, described as the loss of anal sphincter control, leading to the unwanted release of faeces or gas.⁴ Anal incontinence can be further classified as either faecal or flatus incontinence. In the

Abstract

Objective: To assess prevalence of incontinence in a South Australian representative population sample and compare health-related quality of life impact of incontinence with other chronic conditions.

Method: The 1998 South Australian Health Omnibus Survey interviewed 3,010 male and female respondents aged 15 to 97 years (response rate 70.2%). This representative population survey included questions to determine the prevalence of urinary (stress and urge), and anal (faecal and flatus) incontinence, and other chronic conditions. Respondents also completed the MOS SF-36 questionnaire.

Results: Self-reported prevalence of all types of incontinence was 26.0%. The prevalence of anal and urinary incontinence were 10.5% and 20.3% respectively, with 4.8% of respondents experiencing both. Univariate analysis found the prevalence of incontinence was statistically significantly higher among females, and those who were older, widowed, had no post-school education, and lower incomes. After adjusting for differences in age and sex, it was found that people with incontinence were significantly impaired across all dimensions of the SF-36, scoring in the lowest 42%, of the population, compared with those people without incontinence. People with incontinence exhibited different SF-36 profiles to those with other conditions.

Conclusions: Incontinence is common in South Australia, affecting more than one-quarter of the population, particularly older women (56.2% for 60 years and over). The impact of incontinence on health-related quality of life is characteristically different to that demonstrated by other conditions.

Implications: In an ageing population, identification of the impact of incontinence is necessary to direct policy development and resource allocation to this area.

(Aust N Z J Public Health 2004; 28: 165-71)

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Submitted: August 2003

Revision requested: November 2003

Accepted: January 2004

assessment of continence levels and impact in the population, anal incontinence is often neglected and the definitions of the subtypes of the condition are vague. If reported, it is often only in the case of women as a result of childbirth²³ or in the older or institutionalised populations.^{4,25,26} A recent Australian systematic review estimated the prevalence of faecal incontinence among women and men to be 5.3% and 5.5% respectively.²⁷ The differences in prevalence may be due to conflicting definitions of the case ascertainment of faecal, flatus and anal incontinence.^{4,23,28} Anal incontinence often occurs in some bowel conditions,²⁹ with some medications or diabetes,⁵ and is a predominant reason for institutionalisation of elderly people.⁸

Few studies have assessed the health-related quality of life in people with incontinence in a representative population sample. Those that do assess quality of life concentrate only on a particular population group²⁵ or particular types of incontinence,²³ have used samples of convenience, including gynaecology clinics,³¹ institutions and health service authorities,^{6,24} or have used disease-specific instruments to assess health-related quality of life, thus not facilitating comparisons.³² The effect of urinary incontinence on women's health-related quality of life has been discussed previously.³³ However, anal incontinence is rarely assessed through randomly selected population groups and there is a paucity of research on both prevalence and outcome assessment.^{12,24,25,32} No study assessing the impact of urinary incontinence in males or anal incontinence in either gender has been carried out. In order to assess the health outcomes of a condition such as incontinence, health-related quality of life should be considered. A generic, standardised and validated instrument such as the Medical Outcomes Study Short Form SF-36 can be used to compare people with incontinence to the general population, and people with other chronic conditions.

This paper presents population data from across metropolitan and rural South Australia. Health-related quality of life data and prevalence estimates for all types of incontinence have been assessed in order to direct future policy, planning and research agendas.

Methods

Data were obtained from the 1998 Autumn South Australian Health Omnibus Survey (SAHOS). SAHOS has been conducted each year since 1990 and investigates a range of health and health service issues. The methodology of the SAHOS has been reported elsewhere in more detail³⁴ and in various publications.^{15,35,36} A representative population survey conducted on an annual or bi-annual basis, the SAHOS is a clustered, self-weighting, systematic, multistage area sample of metropolitan and country areas with populations of more than 1,000 people. Hospitals, hotels and nursing homes are not included in the sample and no replacement is made for a non-response. Face-to-face interviews are conducted in each respondent's household by trained interviewers. Respondents are selected if they are the person in the household last to have a birthday and aged 15 years or over. Data for this

survey were weighted by age, sex and geographical location to 1996 South Australian Census data, correcting for any sample bias and providing accurate estimates for the South Australian population overall. The response rate was 70.2%.

As part of the survey, respondents were asked if they ever experienced any of the following problems: 'flatus incontinence' – loss of control of wind, and 'faecal incontinence' – loss of control of motions. Respondents were considered to have 'anal incontinence' if they answered yes to either of these questions. Respondents were also asked whether they had ever lost any urine when they did not mean to, when they coughed, sneezed or laughed, 'stress incontinence', or if they had ever suddenly felt the urge to go to the toilet, but had accidentally wet themselves before reaching the toilet, 'urge incontinence'. Respondents were considered to have urinary incontinence if they answered yes to either or both of the stress or urge incontinence questions. Those that responded that they wore incontinence protection aids for urinary incontinence were considered, in this study, to have severe urinary incontinence.

Demographic information was collected on gender, age, marital status, household size, country of birth, highest education level achieved, annual household income, work status and area of residence. Information on asthma, bronchitis, emphysema (classified together as chronic lung disease), osteoporosis, arthritis and diabetes was collected and used to determine co-morbidity status.

Respondents also completed the Australian version of the Medical Outcomes Study SF-36 to assess their health-related quality of life. This instrument has been validated for use in an Australian population, and the standard interpretation and scoring methods of the SF-36 were followed.^{37,38}

Statistical analyses

Using multiple analysis of variance, mean scores were derived for each of the eight scales of the SF-36, adjusting for age and sex. The eight health concepts measured by the SF-36 are defined as Physical Functioning (PF), Role-Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role-Emotional (RE) and Mental Health (MH).³⁸

To compare the scores of people with incontinence to the total population distribution of scores, standard scores were calculated by dividing the difference between the score of the comparison group and that of the general population, by the standard deviation of the general population.² In order to demonstrate this graphically, the mean score of the population was set at zero, and the deviation from this score was measured as a standard score. Additionally, component SF-36 dimensions were translated into two summary dimensions, the physical and mental component summaries (PCS and MCS).³⁹

Univariate analyses were conducted on these variables using SPSS Version 11.0⁴⁰ and odds ratios and statistical significance ($p < 0.05$) were determined using EpiInfo Version 6.04.⁴¹

Results

Sample characteristics

There were 3,010 respondents (48.7% male, 51.3% female) interviewed in this study. Of these, 26.5% were aged below 30 years of age, 51.1% between 30 and 59 years of age, and 22.6% were 60 years or older. These proportions are representative of the age groups of the South Australian population. The age range was from 15 to 97 years of age. The household income per annum of 25.3% of respondents was \$A20,000 or less, 24% had household incomes of \$A20,001 to \$A40,000, and 35.9% earned more than \$A40,000. Most respondents were born in Australia (75.3%), with 12.7% born in the United Kingdom or Ireland and 12.1% born in countries other than these.

Prevalence of incontinence

The prevalence of all types of incontinence, including urinary

or anal incontinence, was 26% (male 11.1%, female 40.1%). The prevalence of specific types of incontinence was 8.9% for flatus incontinence (male 6.8%, female 10.9%), 2.9% for faecal incontinence (male 2.2%, female 3.5%), 17.9% for stress incontinence (male 2.5%, female 32.4%), and 8.9% for urge incontinence (male 2.9%, female 14.5%). Overall, 4.8% of respondents reported having more than one type, and 2.6% of respondents reported having severe urinary incontinence. Table 1 examines the prevalence of these types of incontinence by various demographic variables. The highest prevalence of all types of incontinence was 56.2%, which was seen in women over 60 years, with 20.5% of women over 60 years having severe urinary incontinence.

Incontinence and health-related quality of life

Health-related quality of life was assessed for people with incontinence and compared with that of people without inconti-

Table 1: Prevalence and odds ratio of all types, anal and urinary incontinence, by demographic variables.

| | Incontinence All types | | | Anal incontinence | | | Urinary incontinence | | | | | | | | |
|--------------------------|---------------------------|-------------|-------------------|-------------------|------------|-------------------|----------------------|------------|-------------------|------------|-------------|--------------------|------------|------------|--------------------|
| | n | % | OR | Flatus | | OR | Faecal | | Stress | | | Urge | | OR | |
| | | | | n | % | | n | % | | n | % | OR | n | % | |
| Sex | | | | | | | | | | | | | | | |
| Male | 162 | 11.1 | 1.00 | 100 | 6.8 | 1.00 | 33 | 2.2 | 1.00 | 37 | 2.5 | 1.00 | 43 | 2.9 | 1.00 |
| Female | 619 | 40.1 | 5.37 ^a | 168 | 10.9 | 1.67 ^a | 54 | 3.5 | 1.57 | 501 | 32.4 | 18.49 ^a | 224 | 14.5 | 5.60 ^a |
| Age group | | | | | | | | | | | | | | | |
| 15-29 | 68 | 8.5 | 1.00 | 26 | 3.3 | 1.00 | 7 | 0.9 | 1.00 | 42 | 5.2 | 1.00 | 11 | 1.4 | 1.00 |
| 30-39 | 136 | 22.9 | 3.20 ^a | 42 | 7.2 | 2.27 ^a | 14 | 2.4 | 2.73 ^a | 92 | 15.6 | 3.31 ^a | 31 | 5.3 | 3.96 ^a |
| 40-49 | 166 | 29.9 | 4.57 ^a | 50 | 8.9 | 2.93 ^a | 19 | 3.5 | 4.00 ^a | 129 | 23.2 | 5.43 ^a | 46 | 8.3 | 6.46 ^a |
| 50-59 | 129 | 33.3 | 5.36 ^a | 47 | 12.1 | 4.10 ^a | 11 | 2.9 | 3.30 ^a | 93 | 23.9 | 5.67 ^a | 39 | 10.0 | 8.01 ^a |
| 60-69 | 119 | 38.7 | 6.69 ^a | 39 | 12.6 | 4.28 ^a | 19 | 6.1 | 7.93 ^a | 76 | 24.6 | 5.86 ^a | 49 | 15.8 | 13.47 ^a |
| 70-79 | 126 | 46.6 | 9.38 ^a | 45 | 16.7 | 5.90 ^a | 10 | 3.7 | 4.32 ^a | 85 | 31.4 | 8.21 ^a | 68 | 25.2 | 24.05 ^a |
| 80+ | 37 | 37.7 | 6.40 ^a | 19 | 18.9 | 7.04 ^a | 7 | 6.6 | 8.59 ^a | 21 | 21.5 | 4.84 ^a | 22 | 22.2 | 20.42 ^a |
| Area of residence | | | | | | | | | | | | | | | |
| Metropolitan | 548 | 26.5 | 1.00 | 195 | 9.4 | 1.00 | 50 | 2.4 | 1.00 | 367 | 17.8 | 1.00 | 181 | 8.8 | 1.00 |
| Country | 233 | 24.8 | 0.91 | 73 | 7.8 | 0.81 | 37 | 4.0 | 1.65 ^a | 171 | 18.1 | 0.97 | 85 | 9.1 | 1.04 |
| Education | | | | | | | | | | | | | | | |
| Bachelor degree | 71 | 17.8 | 1.00 | 22 | 6.2 | 1.00 | 7 | 1.9 | 1.00 | 51 | 14.4 | 1.00 | 13 | 3.7 | 1.00 |
| Certificate/diploma | 159 | 26.5 | 1.46 ^a | 49 | 8.2 | 1.35 | 13 | 2.2 | 1.11 | 115 | 19.1 | 1.42 | 59 | 9.8 | 2.88 ^a |
| Trade qualifications | 59 | 15.7 | 0.76 | 35 | 9.3 | 1.57 | 8 | 2.1 | 1.10 | 20 | 5.4 | 0.34 ^a | 17 | 4.5 | 1.26 |
| No post school | 494 | 29.3 | 1.67 ^a | 162 | 9.7 | 1.62 ^a | 60 | 3.5 | 1.85 | 352 | 20.9 | 1.58 ^a | 178 | 10.6 | 3.12 ^a |
| Marital status | | | | | | | | | | | | | | | |
| Married/de facto | 558 | 30.1 | 1.00 | 189 | 10.2 | 1.00 | 54 | 2.9 | 1.00 | 389 | 21.0 | 1.00 | 180 | 9.7 | 1.00 |
| Sep/divorced | 233 | 32.2 | 1.10 | 19 | 8.6 | 0.83 | 7 | 3.3 | 1.09 | 52 | 23.8 | 1.16 | 20 | 9.2 | 0.93 |
| Widowed | 87 | 46.6 | 2.02 ^a | 35 | 18.8 | 2.02 ^a | 10 | 5.5 | 2.79 ^a | 62 | 33.3 | 1.86 ^a | 50 | 26.7 | 3.39 ^a |
| Never married | 65 | 8.7 | 0.50 | 25 | 3.3 | 0.30 ^a | 15 | 2.1 | 0.68 | 34 | 4.6 | 0.18 ^a | 16 | 2.2 | 0.20 ^a |
| Country of birth | | | | | | | | | | | | | | | |
| Australia | 589 | 25.1 | 1.00 | 202 | 8.9 | 1.00 | 75 | 3.3 | 1.00 | 386 | 17.0 | 1.00 | 198 | 8.8 | 1.00 |
| UK/Ireland | 112 | 29.5 | 1.24 | 36 | 9.5 | 1.07 | 4 | 1.1 | 0.31 ^a | 81 | 21.3 | 1.32 ^a | 37 | 9.8 | 1.12 |
| Other | 101 | 27.7 | 1.15 | 30 | 8.3 | 0.92 | 8 | 2.2 | 0.66 | 71 | 19.5 | 1.18 | 31 | 8.5 | 0.97 |
| Household income | | | | | | | | | | | | | | | |
| >\$40,000 | 274 | 20.0 | 1.00 | 98 | 6.4 | 1.00 | 16 | 1.4 | 1.00 | 161 | 14.9 | 1.00 | 49 | 4.5 | 1.00 |
| \$20,001-\$40,000 | 185 | 25.6 | 1.37 ^a | 68 | 9.3 | 1.52 ^a | 21 | 2.9 | 1.99 | 124 | 17.2 | 1.18 | 63 | 8.7 | 2.01 ^a |
| Up to \$20,000 | 217 | 36.0 | 2.24 ^a | 69 | 12.8 | 1.78 ^a | 39 | 5.2 | 3.60 ^a | 185 | 24.3 | 1.84 ^a | 115 | 15.1 | 3.76 ^a |
| Not stated | 106 | 23.9 | - | 34 | 7.6 | - | 11 | 2.5 | - | 68 | 15.3 | - | 40 | 9.0 | - |
| TOTAL | 782 | 26.0 | | 268 | 8.9 | | 87 | 2.9 | | 538 | 17.9 | | 267 | 8.9 | |

Notes:

(a) Statistically significantly different (χ^2 test $p < 0.05$) than comparison group (OR=1).

nence. Mean scores adjusted for age and sex for each of the eight dimensions on the SF-36 scale were calculated and these results are presented in Table 2. Respondents who reported that they had any form of incontinence scored statistically significantly lower across all scales of the SF-36 when compared with those respondents who had not experienced incontinence. Respondents who reported that they experienced any type of anal incontinence scored lower than any type of incontinence (including urinary). Those who reported severe urinary incontinence also scored statistically significantly lower.

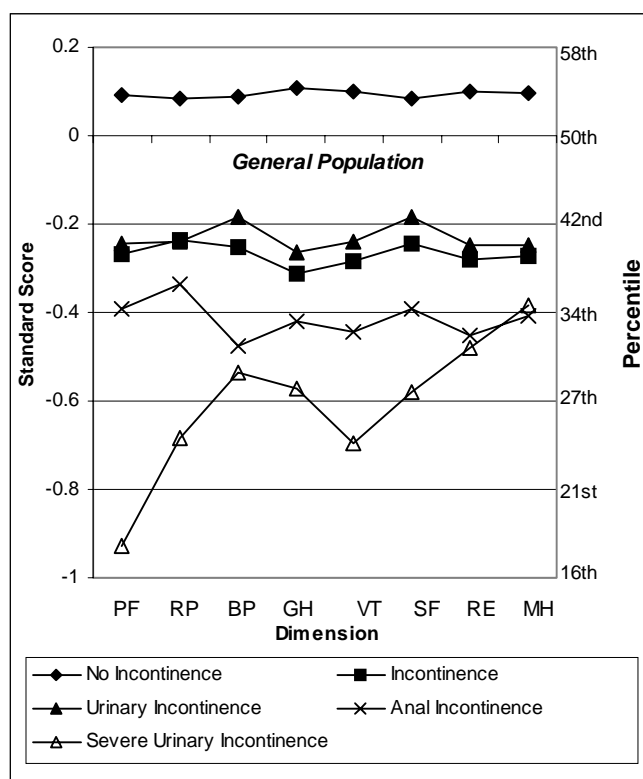
Respondents reporting other chronic diseases (arthritis, osteoporosis, diabetes and chronic lung disease) were also assessed in terms of health-related quality of life, and their standard scores were compared with those who experienced incontinence (see Table 2).

Figure 1 illustrates the differences in scores between respondents who reported particular types of incontinence as well as respondents who reported no incontinence after adjusting for age and sex. The scores were similar in both the scales measuring physical functioning (PF, RP, BP & GH) and those measuring mental health (VT, SF, RE & MH) for incontinence. Respondents who reported all types of incontinence, and those reporting just urinary incontinence, experienced a mild effect on quality of life compared with the general population; however, those who reported anal incontinence experienced a moderate effect.⁴²

Scores for the MCS and PCS are shown in Table 3. People with incontinence had lower MCS scores than people with all other conditions assessed, except osteoporosis as well as higher PCS scores.

When people with different categories of incontinence were compared with those without incontinence, in all cases those incontinent scored statistically significantly lower on the MCS and PCS scores of the SF-12. [AUTHOR: CHECK – SF-36??]

Figure 1: SF-36 standard scores for people with and without incontinence, compared with the general population and adjusted for age and sex.



Discussion

This paper reports the results of the first Australian population survey concerning the main types of incontinence encompassing all adult age groups, using face-to-face interviews. The paper is also the first to compare the health-related quality of life of people with different subtypes of incontinence to those without in-

Table 2: SF-36 mean scores for people with incontinence, different types of incontinence, and other chronic conditions (adjusted for age and sex).

| | n | PF | RP | BP | GH | VT | SF | RE | MH |
|-----------------------------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| No incontinence | 2,252 | 87.2 ^b | 82.8 ^b | 74.5 ^b | 76.2 ^b | 66.4 ^b | 89.7 ^b | 90.7 ^b | 81.6 ^b |
| Incontinence | 782 | 79.9 ^a | 71.4 ^a | 67.1 ^a | 67.3 ^a | 58.5 ^a | 82.7 ^a | 79.6 ^a | 75.4 ^a |
| Urinary incontinence | 611 | 80.3 ^a | 71.3 ^a | 68.6 ^a | 68.4 ^a | 59.4 ^a | 83.9 ^a | 80.6 ^a | 75.8 ^a |
| Severe urinary incontinence | 77 | 66.4 ^a | 55.6 ^a | 60.9 ^a | 61.8 ^a | 50.1 ^a | 75.4 ^a | 73.8 ^a | 73.5 ^a |
| Stress incontinence | 538 | 81.6 ^a | 71.6 ^a | 68.9 ^a | 69.0 ^a | 59.9 ^a | 84.1 ^a | 80.7 ^a | 76.1 ^a |
| Urge incontinence | 267 | 75.1 ^a | 68.8 ^a | 66.5 ^a | 65.1 ^a | 56.6 ^a | 81.1 ^a | 78.9 ^a | 74.3 ^a |
| Anal incontinence | 316 | 77.3 ^a | 67.9 ^a | 62.3 ^a | 65.0 ^a | 55.2 ^a | 79.5 ^a | 74.6 ^a | 73.1 ^a |
| Flatus incontinence | 268 | 77.3 ^a | 67.9 ^a | 62.2 ^a | 65.0 ^a | 55.2 ^a | 79.4 ^a | 74.6 ^a | 73.1 ^a |
| Faecal incontinence | 87 | 67.3 ^a | 58.1 ^a | 57.8 ^a | 51.8 ^a | 46.6 ^a | 68.3 ^a | 73.2 ^a | 69.7 ^a |
| Combined incontinence | 145 | 72.1 ^a | 61.2 ^a | 61.2 ^a | 61.7 ^a | 52.0 ^a | 75.9 ^a | 70.9 ^a | 70.8 ^a |
| Diabetes | 127 | 75.4 ^b | 62.4 ^b | 64.9 | 57.6 ^b | 58.3 | 78.9 | 80.9 | 77.2 |
| Chronic lung disease | 797 | 80.2 | 71.8 | 67.2 | 66.6 | 59.5 | 82.5 | 83.1 ^b | 77.3 ^b |
| Osteoporosis | 96 | 69.3 ^b | 60.5 ^b | 50.5 ^b | 56.0 ^b | 51.6 ^b | 77.5 ^b | 79.1 | 72.3 |
| Arthritis | 647 | 73.7 ^b | 64.1 ^b | 60.2 ^b | 63.6 ^b | 56.5 ^b | 81.3 | 81.8 | 75.7 |

Notes:
 (a) Statistically significantly different (t test p<0.05) than people without incontinence.
 (b) Statistically significantly different (t test p<0.05) than people with incontinence.

Table 3: Mean scores for the SF-36 MCS and PCS for people with different types of incontinence, and other chronic conditions (adjusted for age and sex).

| | n | MCS | (95% CI) | PCS | (95% CI) |
|-----------------------------|-------|--------------------|---------------|--------------------|---------------|
| No incontinence | 2,252 | 51.63 ^b | (51.21-52.04) | 49.94 ^b | (49.58-50.30) |
| Incontinence | 782 | 47.86 ^a | (47.12-48.59) | 46.91 ^a | (46.27-47.56) |
| Urinary incontinence | 611 | 48.32 ^a | (47.47-49.16) | 47.15 ^a | (46.41-47.89) |
| Severe urinary incontinence | 77 | 48.47 ^a | (47.50-49.31) | 47.48 ^a | (46.69-48.26) |
| Stress incontinence | 538 | 47.47 ^a | (46.23-48.70) | 45.66 ^a | (44.59-46.74) |
| Urge incontinence | 267 | 46.61 ^a | (44.14-49.08) | 41.75 ^a | (39.49-44.02) |
| Anal incontinence | 316 | 45.97 ^a | (44.88-47.06) | 45.29 ^a | (44.35-46.24) |
| Flatus incontinence | 268 | 46.32 ^a | (45.14-47.50) | 45.72 ^a | (44.68-46.75) |
| Faecal incontinence | 87 | 43.44 ^a | (41.38-45.49) | 41.92 ^a | (40.14-43.70) |
| Combined incontinence | 145 | 44.11 ^a | (43.49-46.74) | 45.00 ^a | (42.59-45.41) |
| Diabetes | 127 | 48.48 | (46.74-50.21) | 43.71 ^b | (42.21-45.21) |
| Chronic lung disease | 797 | 48.74 ^b | (48.06-49.41) | 46.65 | (46.06-47.23) |
| Osteoporosis | 96 | 46.52 | (44.49-48.53) | 41.99 ^b | (40.25-43.74) |
| Arthritis | 647 | 48.58 | (47.75-49.41) | 43.70 ^b | (43.01-44.39) |

Notes:(a) Statistically significantly different (*t* test $p < 0.05$) than people without incontinence.(b) Statistically significantly different (*t* test $p < 0.05$) than people with incontinence.

continence, and those with other chronic diseases. Other similar research has been limited in method, concentrated only on urinary incontinence, and used mail-out questionnaires or samples of convenience, such as health service registers or specific populations as part of clinical trials, with limited response rates.^{10,12,13,23} There are few epidemiological studies that include an assessment of the prevalence of anal incontinence or that address the health-related quality of life status of people with anal incontinence.²³

The main limitation of this study was that incontinence was self reported and any occurrence of the episodes described, throughout the respondent's life, was considered an incontinence event. The frequency of occurrence was not considered, so transient incontinence was included even though it may not have been part of a chronic condition and may have been related to urinary tract infections, gastroenteritis, pregnancy or recent childbirth. The questions in this study asked how serious the respondent thought the problem was, and severity was assessed for urinary incontinence via use of incontinence aids or protection. However, the use of aids does not relate well to urine loss and socio-economic factors have been shown to affect their use.¹¹ Additionally, a study of older Australian women found that only 74.8% of those who reported leaking urine sometimes or often wore protective pads.⁴³ An alternative assessment of severity, such as frequency and amount, as advocated by the International Continence Society,⁴⁴ gives an indication of the timeframe of the problem, and the context of the incontinence event may be useful. A further study concerning the severity of both faecal and urinary incontinence is necessary to reduce the deficit of research in this area.

Definitions of the different types of incontinence in this study were similar to those used in other research, particularly for stress

and urge incontinence,^{13,18} but differed for faecal and flatus incontinence, with other studies often including both types in the definition for faecal, which made comparisons of prevalence rates difficult.

From the results of this study, it can be seen that incontinence affects more than one-quarter of the population, an extremely high prevalence that surpasses other chronic conditions such as diabetes (6.2%), asthma (12.7%),⁴⁵ arthritis (21.2%),⁴⁶ and osteoporosis (4.8%)⁴⁷ in South Australia. As this survey is a population sample and it excludes people residing in nursing homes and hospitals, this prevalence may be an underestimate of the total burden, as incontinence is known to be most common in the elderly, particularly those in aged care facilities.⁸ The prevalence of incontinence in the elderly age groups peaked in this study at 46.6% for the 70-79 year age group, but this is likely to be an underestimation as the prevalence of urinary incontinence in both Australian and overseas nursing homes has been shown to be as high as 77%.^{16,20} This study excluded those in institutional care.

As expected from previous research, the prevalence for all types of incontinence was statistically significantly greater for females and also increased with age.^{4,27} This is not surprising given the aetiological factors associated with incontinence, including childbirth, age-related changes in physiology and the increase of comorbid conditions in later life.¹⁹ It was also found that respondents with lower education levels exhibited a statistically significantly higher prevalence of all types of incontinence and urinary incontinence, which may have, in turn, contributed to the lower quality of life experienced by people with incontinence. This may reflect the increased number of elderly widowed women that are represented in this group. Our previous study correlating incontinence with mode of delivery suggested that the physiological changes of pregnancy contributed most to future pelvic floor dysfunction,

including incontinence, and that abdominal delivery by caesarean section had little protective effect from subsequent pelvic floor morbidity in comparison to spontaneous vaginal delivery unless it avoided the increased morbidity that was seen with instrumental vaginal delivery.¹⁵

Incontinence may not be life threatening, but it is quality-of-life threatening. This study verifies that all types of incontinence have a significant impact on health-related quality of life. Quality-of-life issues are particularly important when considering elderly residents of nursing homes with short life expectancies,²⁰ as incontinence is often the reason for their institutionalisation. When comparing respondents with any type of incontinence to those without incontinence, mean scores for people with incontinence were significantly lower for all dimensions of the SF-36 and also for both the MCS and PCS. This is understandable considering the debilitating effects of incontinence. Physical Functioning (PF) and Role-Physical (RP) are affected, making it difficult to carry out day-to-day duties such as housework or other physical work including exercise. Activities that require bending down increase pressure on the bowel and bladder,¹⁷ while going for a walk increases the distance away from toilet facilities. Physical barriers to continence around the home include hindrances such as poor lighting and lack of privacy.¹⁶ Even dealing with others at work may be adversely affected if constantly excusing oneself mid conversation to go to the toilet. There may also be a general loss of productivity. Sexual difficulties due to incontinence may also occur. Rushing to the toilet may also be particularly difficult for older people and increases their risk of falls.

Increased bodily pain (BP) may be associated with the causes and effects of incontinence, such as cramping or skin problems due to moisture and irritation.²² General health (GH) may either be affected by associated conditions, or the incontinence itself being regarded as unhealthy. Incontinent people may not exhibit the normal signs of vitality (VT) as their condition constantly drains on their lifestyle.⁴⁹ Social functioning (SF) and emotional role (RE) describe interaction with others as well as activities where this may take place. The incontinent person may need to limit activities due to their condition; they need to be close to toilets and this may discourage venturing out into unfamiliar territory, creating social isolation. Sexual difficulties may also contribute to the deficit in these dimensions. Fear of embarrassment or personal smell also contribute to problems in this area.³² Incontinence is often underreported due to the embarrassment associated with the problem. Mental health (MH) is influenced as incontinence wears on the state of mind. Low self-esteem, depression, feelings of helplessness and social isolation often occur due to incontinence.¹⁸

Respondents who reported episodes of anal, particularly faecal, incontinence scored statistically significantly lower on both the PCS and the MCS than all types of incontinence or just urinary incontinence, with faecal incontinence scoring significantly lower than all types of anal incontinence on the MCS. Faecal incontinence is a more visible, messy condition than urinary incontinence and is associated with humiliation and loss of control over

lifestyle. Social continence is hard to achieve due to the odour, unlike urinary incontinence where social continence can usually be achieved by using pads. It also increases the demands on carers of those with the condition. Severe urinary incontinence scored statistically significantly lower on the PCS scale than all types of incontinence, and when broken down both urinary and anal incontinence. This reflects the high probability of physical disease associated with a PCS score below 50⁵⁰ as severe urinary incontinence often occurs with other chronic illness and age.¹⁹ The implications of scoring low on the PCS include detrimental effects on working life, increased use of medical services, and increased probability of a chronic condition.⁵⁰

Some chronic conditions, such as the painful, mobility-limiting conditions of arthritis and osteoporosis, exhibit a similar SF-36 profile to each other. These demonstrate a different profile to incontinence, which may not affect movement and physical activity quite as much. However, the profile illustrated by chronic lung disease is fairly similar to that of incontinence, perhaps as both of these conditions are more task limiting and perhaps socially isolating than they are painful.

Both urinary and anal incontinence are shown in this study to have a significant impact on the population, particularly in terms of their intangible costs to both individuals and overall society. The problems of incontinence are unique to the condition and specifically affect health-related quality of life. Patients may be discouraged to report incontinence to their health professionals due to lack of emphasis on this condition during medical training.^{22,27} The benefits of attending to and preventing the problem of incontinence might be cost effective¹⁰ and increase quality of life of both sufferers and their carers. The first step in addressing the problem of incontinence in an ageing population, such as that of South Australia, is the identification of the impact of incontinence. This is necessary to encourage policy development and resource allocation to this area.

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AUTHOR REF: 31. Check title: Is it really 'Promoting urinary incontinence..' (continence?)

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