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Constipation in Australian Women: Prevalence and Associated Factors

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Abstract: A postal health survey was completed by 14 761 young women (aged 18–23 years), 14 070 middle-aged women (45–50 years) and 12 893 older women (70–75 years). The prevalence of constipation was 14.1% (CI 13.5–14.7) in young women, 26.6% (CI 25.9–27.4) in middle-aged women, and 27% (CI 26.9–28.5) in the older women. The prevalence of hemorrhoids was 3.2% (CI 2.9–3.4 young), 17.7% (CI 17.1–18.4 middle-aged) and 18.3% (CI 17.6–19.0 older). In the middle-aged and older women, those who reported previous gynecologic surgery were between 18% and 63% more likely to report constipation; in the younger cohort, women with one or two children were also more likely to report constipation (adjusted OR 1.43–1.46). One-third of the young women and half the middle-aged and older women had sought help for constipation; the majority indicated that they were satisfied with the help available to them.

Keywords: Constipation; Hemorrhoids; Hysterectomy; Parity; Pelvic floor; Women

Introduction

Constipation is a subjective term used to describe difficulty in defecation, either because of the infrequent passage of small hard stools, or because of straining at defecation, or both [1]. In a study of 'normality' in bowel function patterns among 789 people not seeking health care, Drossman et al. suggested that constipation might be defined as 'straining at stool $\geqslant$25% of the time or passing two or fewer stools per week' [2].

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Excluding mechanical obstruction and other organic disease, there are two common 'functional' underlying causes of constipation. Idiopathic 'slow transit' constipation is caused by retarded colonic motility [3], whereas outlet obstructive constipation is caused by rectosigmoid outlet delay, either as obstructed defecation due to anorectal dysfunction, or because of pelvic floor laxity, as occurs in the descending perineum syndrome [4,5].

Because bowel patterns in individuals change over time, and because prevalence studies have used different definitions of constipation, it is difficult to obtain an accurate estimate of the prevalence of constipation in adult populations. In the United States, studies of self-report of constipation within the last 10 years estimate the prevalence in men to be between 1% and 8%, and in women between 3% and 17% [6–9]. Outlet delay is clearly more common in women than in men [9]. The sex difference in self-reported constipation is even more marked in older populations: Australian data suggest that older women report constipation 42% more often than older men [10].

In light of this high prevalence, it is interesting to note that there was no reference to constipation in the 1990–91 Bridges-Webb survey of morbidity and treatment in Australian general practice [11]. It would therefore appear that constipation is not a problem which is often brought to the attention of general practitioners. However, data from Australian pharmacies suggest a high use of self-help remedies for constipation. Although there are no records of supermarket sales of 'over-the-counter' laxatives, it has been estimated that retail pharmacies purchased $31.6m worth (wholesale) of these products in 1995 [12]. Chronic laxative abuse is also thought to contribute to constipation through local injury to the innervation of the colon and subsequent dysmotility [13].

Apart from the influence of dietary fiber and fluid intake on bowel function, a number of other factors are thought to be associated with constipation. These include medications such as aspirin, narcotic analgesics, muscle relaxants, antidepressants, diuretics, anticholingerics, non-steroidal anti-inflammatory drugs, iron supplements, aluminium and calcium antacids, and calcium antagonists. As compound analgesics, anti depressants and iron supplements are also more commonly used by women [14], their use may contribute to the higher prevalence of constipation in women.

Hormonal differences may also contribute to this problem in women. Progesterone is thought to decrease the rate of small bowel and colonic transit, contributing to constipation during the luteal phase of the menstrual cycle and during pregnancy [15]. To our knowledge there have been no studies of the association between constipation and the use of hormone replacement therapy (HRT) in women.

Damage to the pelvic floor muscles and their innervation, which can occur during childbirth or gynecological surgery, may also contribute to constipation in women [16–19]. Repeated straining at stool is thought to exacerbate the damage, resulting in weakness of the pelvic floor, perineal descent during straining, and secondary anatomic changes which result in anorectal dysfunction and difficulty in defecation [18,20–22]. Constant straining at stool has also been implicated in the development of uterovaginal prolapse in the presence of defective uterine supports [22], and it has been estimated that up to 50% of parous women have some degree of genital prolapse [23].

The Australian Longitudinal Study on Women's Health (now known as the Women's Health Australia (WHA) Project) provided an opportunity to determine the prevalence of constipation, and associated factors such as hemorrhoids and prolapse, in Australian women. The aim of this study was to explore associations between constipation and factors such as parity, hormone and drug use, and gynecologic surgery in the three large cohorts of Australian women who participated in the baseline surveys of the project. It was hypothesized that women who had had children, and those who had had any form of gynecologic surgery, or were taking HRT or drugs to help with 'nerve' or sleeping problems, would be more likely to report constipation. It was also hypothesized that women who reported constipation would be more likely to report hemorrhoids and prolapse.

Materials and Methods

The Women's Health Australia project involves three cohorts of women aged 18–23 ('young'), 45–50 ('middle-aged') and 70–75 years ('older') at the time of the baseline survey in 1996. The women were selected randomly from the Australian Medicare database, which includes all women who are resident in Australia, including those from minority ethnic groups as well as recent migrants and refugees. Because there is a dearth of information about women who live outside the metropolitan areas, women who live in rural and remote areas of Australia were oversampled. Details of the recruitment methods are described elsewhere [24].

Participants

During 1996 14 761 young women (41% of those invited to participate), 14 070 middle-aged women (54%) and 12 893 older women (37%) completed the baseline surveys for the WHA project. Precise response rates cannot be provided, as the Medicare database is not routinely linked to death or migration records; invitations might therefore have been sent to women no longer living in Australia, or to women who might have died. Telephone follow-up to explore these possibilities, and to encourage participation, was not possible because privacy restrictions precluded the researchers from accessing any information about the selected women until they had consented to participate. The participants include women from all walks of life, living in every State and Territory of Australia. A summary of their sociodemographic characteristics, and a comparison with women of the same age in the 1996 population census, is shown in Table 1. They are broadly representative of the female population of these age groups, but with an overrepresentation of married women and women with college or university education [24].

Questionnaire and Measures

The baseline questionnaire consisted of 252, 285 and 260 items, respectively, for the young, middle-aged and older cohorts. One of the items asked whether the women had experienced constipation, hemorrhoids or 'other bowel problems' in the last 12 months. Response options were *never*, *rarely*, *sometimes*, *often*. Responses of *sometimes* and *often* were used to estimate the prevalence of constipation and hemorrhoids. The women were also asked whether they had sought help for each of these symptoms and, if so, whether they had been satisfied with the services available to help them. Responses to this question (*yes*, *no*, *not applicable* [*i.e. not experienced or no help sought*]) were used to estimate the proportion of women seeking help, and to provide some indication of satisfaction with the available help.

Respondents in all three cohorts were asked to report the number of times they had given birth, and those in the middle-aged cohort were asked if they had experienced going through the menopause in the last 12 months (*yes/no*). Women in both the middle-aged and the older cohorts were asked about hormone replacement therapy (HRT) (*'Are you currently taking HRT?' [yes/no]; 'For how many years in total have you ever used HRT? [never, less than one year, 1–4 years, 5–10 years, more than 10 years]*), gynecologic surgery (*'Have you ever had a hysterectomy/both ovaries removed/repair of*

a prolapsed vagina, bladder or bowel?' [yes/no]), and medication (*During the past four weeks, have you taken any medication for your nerves [e.g. Valium, Serapax, Ducene, etc.) [yes/no], or to help you sleep (e.g. Normison, Mogadon etc.) [yes/no]*). Women in the older cohort were also asked *'Have you ever been told by a doctor that you have a prolapse?' [yes/no].*

Data Analysis

Descriptive statistics, including proportions and 95% confidence intervals, were calculated for self-reporting of constipation and hemorrhoids in each of the three cohorts. Estimates of the use of the satisfaction with services available to help with these problems were also calculated.

For each separate age cohort, variables which have a clinically plausible association with constipation were then entered into a logistic regression model to examine the strength of the associations between constipation and each of the variables, while controlling for the others.

For the younger age cohort the variables entered into the model were: parity, other bowel problems and hemorrhoids. For the middle-aged and older cohorts the variables were: parity, years of HRT use, gynecologic surgery (including removal of both ovaries, hysterectomy and repair of prolapsed vagina, bladder and bowel), other bowel problems, hemorrhoids, taking drugs to help sleep and taking drugs to help 'nerves'. For the middle-aged cohort one additional variable, going through the menopause in the last year, was also included.

Results

Prevalence estimates for sometimes or often experiencing constipation and hemorrhoids are shown in Table 2. The proportion of middle-aged and older women who reported constipation was twice that of the younger cohort, in whom the prevalence of hemorrhoids was also very low (see Table 2).

Factors Associated with Constipation

The logistic regression analyses showed that hemorrhoids and other bowel problems were significantly associated with constipation in all three cohorts. Women who reported sometimes or often having hemorrhoids were three to nine times more likely to report constipation, after adjustment for other variables in the models. A strong association was also found in each age cohort between self-reporting of constipation and 'other bowel problems' (Tables 3).

A significant association between parity and constipation was found only in the young cohort. Almost 10% of

Table 1. Sociodemographic characteristics for respondents and the general Australian population (ABS, 1996) [29]

	Young Cohort *n* = 14 761 (%)	Population *n* = 759 680 (%)	Middle-aged Cohort *n* = 14 070 (%)	Population *n* = 734 155 (%)	Older Cohort *n* = 12 893 (%)	Population *n* = 377 152 (%)
Present marital status						
Married	8.2	9.0	75.1	73.0	54.7	48.9
Defacto	12.0	NA*	5.7	NA*	0.6	NA*
Separated/divorced	0.8	1.1	13.2	18.7	6.3	6.8
Widowed	0.0	0.2	2.1	2.7	35.2	39.9
Single/never married	79.0	89.8	3.9	5.6	3.2	4.4
Country of birth						
Australia	88.6	77.8	69.0	62.6	68.5	66.4
Other English-speaking	3.5	4.1	13.9	11.6	12.4	11.0
Other Europe	1.3	1.6	8.7	11.0	9.7	12.7
Asia	3.6	10.6	4.3	8.2	1.8	3.3
Other/not stated	3.0	6.0	4.1	6.5	7.6	6.5
Main current employment status						
Full-time paid	31.3	32.4	36.1	36.0	N/A	N/A
Part-time/casual	19.2	26.4	30.1	28.5		
Worked without pay/other employed	1.9	1.7	7.0	2.0		
Unemployed	6.4	10.5	1.9	4.0		
Not in labor force (including students)	39.4	26.3	21.6	27.0		
Not stated	1.8	2.7	3.3	2.5		
Highest qualification completed						
No post-school qualification	69.8	69.3	63.1	61.8	79.8	70.4
Trade/apprentice	2.4	7.9	3.5	7.0	3.7	2.7
Certificate/diploma	15.1	6.0	15.9	8.7	7.3	3.3
University or higher degree	12.1	7.7	16.3	11.6	4.0	2.4
Other (not stated/inadequately described)	0.6	9.1	1.2	10.8	5.0	21.2

* Defacto included in 'never married'.

Table 2. The prevalence of self-reporting of constipation and hemorrhoids (sometimes or often) in the three cohorts of Australian women. (Proportion reporting each symptom sometimes or often)

	Constipation			Hemorrhoids		
	*n**	%	95% CI	*n**	%	95% CI
Young women						
18–23 years	14 659	14.1	13.5–14.7	14 659	3.2	2.9–3.4
Middle-aged women						
45–50 years	13 910	26.6	25.9–27.4	13 900	17.7	17.1–18.4
Older women						
70–75 years	11 918	27.7	26.9–28.5	11 824	18.3	17.6–19.0

* Number who answered the relevant question.

the young women reported having at least one child, and these women were more than 40% more likely to report constipation (Table 3a).

The large sample size in this study permitted a detailed exploration of the associations between constipation and several combinations of gynecologic surgery. There were significant associations between self-reporting of constipation and both hysterectomy and prolapse repair in the middle-aged and older cohorts. All combinations of these surgical procedures with each other and with oophorectomy were also significantly associated with constipation, except in those cases where the sample size was very small (see Tables 3b and 3c).

In the older cohort 22.7% of women reported ever being told by a doctor that they had a prolapsed vagina, bladder or bowel (data not included in the regression model). These women were more likely to report constipation than those who had never been told they had a prolapse (prolapse 35.6%, no prolapse 24.6%; difference = 11.0%, 95% CI for difference = 9%–13%).

Approximately one-third of women in the middle-aged group reported going through the menopause in the last 12 months, and these women were slightly more likely to report constipation (see Table 3b). The use of HRT for up to 5 years was also associated with constipation in the middle-aged cohort, but not in the older cohort.

In the middle-aged and older cohorts there were also significant associations between constipation and the use of medications for 'nerves' and sleeping difficulty. The use of these medications was more common in the older women (medication for 'nerves' reported by 7.3% of the middle-aged group and 11.3% of the older women; medication for 'sleeping difficulties' reported by 6.7% of the middle-aged group and 17.1% of the older women). The use of sleeping medications was strongly associated with constipation in both groups (see Tables 3b and 3c).

Approximately one-third of the young women and half of the middle-aged and older women who reported constipation indicated that they had sought help for this. Details about the type of help sought were not collected. Of those who had sought advice or assistance, the majority indicated that they were satisfied with the help available to them, particularly in the middle-aged and older groups (Table 4).

Although the overall prevalence of hemorrhoids was low in the younger women, almost 20% of women in the middle-aged and older groups reported this problem. About half of all women who reported hemorrhoids said they had sought help, and a large majority were happy with the help they received (Table 4).

Discussion

This was an opportunistic cross-sectional analysis of data collected as part of the longitudinal Women's Health Australia Project. Major strengths of the study were the large sample size and the inclusion of several variables whose relationship with constipation has not previously been explored. The main limitation of this study was that the analysis relied on the women's own perceptions and self-reporting of constipation (and other bowel problems), which may not concur with medical definitions. Another limitation was that many factors thought to be associated with constipation, such as fiber and fluid intake, thyroid disease. Parkinson's disease, child abuse and sexual assault [13], were not included in the WHA baseline surveys. The response rates for this study were higher than for most unsolicited mailed surveys [24] and compare favorably with previous surveys which have requested long-term commitment and involvement [24]. However, the issue of response bias cannot be ignored, and comparison with census data found under-representation of some groups, such as immigrants from Asia and other non-English speaking countries, and over-representation of women with tertiary education. In the older cohort there is also likely to be over-representation of 'healthy' women and under-representation of women in nursing home care.

The results of this study indicate that constipation is probably more common among Australian women than previous estimates might suggest. This may, however, reflect our inclusion of both 'sometimes' and 'often' in the prevalence estimates. Although the proportion of middle-aged and older women who reported constipation was almost double that of the younger women, there was no evidence of an age-related increase in constipation after middle age. This might be explained by cohort differences in perceptions of constipation, or by the over-representation of more 'healthy' women in the

Table 3. Crude and adjusted odds ratio (and 95% confidence intervals [95% CI]) for variables associated with constipation

		n	Crude odds ratio (95% CI)	Adjusted* odds ratio (95% CI)
a) Young cohort				
Parity	None	13 056	1.00	1.00
	One	1 071	1.66 (1.41–1.94)	1.29 (1.08–1.54)
	Two	281	1.90 (1.43–2.53)	1.46 (1.06–2.00)
	⩾Three	65	1.33 (0.69–2.54)	0.81 (0.38–1.70)
	Unknown	288		
Other bowel problems	Never	12 780	1.00	1.00
	Rarely	1 007	2.65 (2.27–3.09)	2.41 (2.05–2.83)
	Sometimes	569	6.59 (5.53–7.84)	5.85 (4.87–7.02)
	Often	300	9.73 (7.70–12.31)	8.57 (6.68–10.98)
	Unknown	105		
Hemorrhoids	Never	13 604	1.00	1.00
	Rarely	591	2.66 (2.20–3.22)	2.17 (1.77–2.65)
	Sometimes	338	7.48 (6.00–9.32)	6.11 (4.82–7.75)
	Often	126	14.35 (9.87–20.87)	9.30 (6.15–14.08)
	Unknown	102		
* Adjusted for all variables in the model				
b) Middle-aged cohort				
Parity	None	1 092	1.00	1.00
	One	1 173	1.24 (1.02–1.50)	1.05 (0.85–1.29)
	Two	5 123	1.10 (0.95–1.29)	0.96 (0.81–1.14)
	Three	5 952	1.18 (1.02–1.38)	1.00 (0.85–1.18)
	Unknown	730		
Menopause in last year	No	8 842	1.00	1.00
	Yes	4 984	1.37 (1.27–1.48)	1.09 (0.99–1.20)
	Unknown	244		
HRT (years)	Never	10 214	1.00	1.00
	<1 year	1 464	1.54 (1.37–1.74)	1.24 (1.07–1.43)
	1–4 years	1 638	1.69 (1.51–1.90)	1.30 (1.13–1.50)
	5–10 years	516	1.72 (1.43–2.07)	1.22 (0.97–1.53)
	>10 years	181	2.42 (1.79–3.27)	1.45 (0.99–2.12)
	Unknown	57		
Gynecologic surgery	None	10 202	1.00	1.00
	HX	1 691	1.54 (1.38–1.72)	1.31 (1.15–1.49)
	HX & prolapse	594	2.06 (1.73–2.44)	1.41 (1.16–1.72)
	HX & OX	605	1.91 (1.61–2.27)	1.33 (1.07–1.65)
	HX & OX & prolapse	195	3.00 (2.25–4.00)	1.61 (1.14–2.27)
	Prolapse	397	1.66 (1.34–2.06)	1.33 (1.05–1.70)
	OX & prolapse	7	2.45 (0.55–10.94)	1.54 (0.32–7.39)
	OX	78	1.22 (0.74–2.02)	1.11 (0.61–2.01)
	Unknown	301		
Other bowel problems	Never	11 222	1.00	1.00
	Rarely	1 167	2.04 (1.80–2.32)	1.63 (1.41–1.91)
	Sometimes	1 020	3.65 (3.20–4.16)	2.51 (2.17–2.91)
	Often	446	4.69 (3.87–5.69)	3.05 (2.45–3.79)
	Unknown	215		
Hemorrhoids	Never	9 104	1.00	1.00
	Rarely	2 332	1.73 (1.56–1.92)	1.53 (1.37–1.72)
	Sometimes	1 887	4.61 (4.15–5.12)	3.84 (3.43–4.30)
	Often	577	7.72 (6.45–9.22)	5.78 (4.75–7.03)
	Unknown	170		
Drugs for sleeping difficulties	No	12 838	1.00	1.00
	Yes	1 033	2.09 (1.84–2.39)	1.65 (1.41–1.94)
	Unknown	199		
Drugs for 'nerves'	No	12 958	1.00	1.00
	Yes	943	1.95 (1.70–2.23)	1.22 (1.03–1.46)
	Unknown	169		

HX, hysterectomy; OX, oophorectomy.
* adjusted for all variables in the model

Continued over

Table 3. *continued*

		n	Crude odds ratio (95% CI)	Adjusted* odds ratio (95% CI)
c) Older cohort				
Parity	None	1 087	1.00	1.00
	One	1 110	1.10 (0.90–1.34)	0.94 (0.75–1.17)
	Two	3 011	1.17 (0.99–1.38)	0.97 (0.80–1.16)
	Three or more	7 277	1.17 (1.01–1.36)	0.99 (0.84–1.17)
	Unknown	408		
HRT (years)	Never	9 878	1.00	1.00
	<1 year	930	1.18 (1.01–1.37)	1.08 (0.91–1.29)
	1–4 years	933	1.37 (1.18–1.60)	1.13 (0.95–1.34)
	5–10 years	469	1.29 (1.05–1.59)	1.06 (0.84–1.35)
	>10 years	477	1.40 (1.15–1.72)	0.96 (0.76–1.22)
	Unknown	206		
Gynecologic surgery	None	7 004	1.00	1.00
	HX	1 198	1.32 (1.15–1.52)	1.17 (1.00–1.38)
	HX & prolapse	653	1.59 (1.33–1.90)	1.20 (0.98–1.45)
	HX & OX	1 133	1.35 (1.17–1.56)	1.17 (1.00–1.38)
	HX & OX & prolapse	623	1.92 (1.61–2.30)	1.30 (1.05–1.60)
	Prolapse	840	1.59 (1.36–1.86)	1.34 (1.12–1.61)
	OX & prolapse	29	2.44 (1.15–5.16)	1.47 (0.64–3.37)
	OX	91	0.84 (0.49–1.43)	0.72 (0.39–1.30)
	Unknown	1 322		
Other bowel problems	Never	8 975	1.00	1.00
	Rarely	1 061	2.03 (1.77–2.33)	1.42 (1.22–1.65)
	Sometimes	1 075	3.17 (2.78–3.61)	2.16 (1.86–2.51)
	Often	537	4.19 (3.50–5.03)	2.57 (2.08–3.17)
	Unknown	1 245		
Hemorrhoids	Never	7 896	1.00	1.00
	Rarely	1 764	1.96 (1.74–2.20)	1.70 (1.50–1.93)
	Sometimes	1 654	4.37 (3.91–4.90)	3.51 (3.10–3.98)
	Often	510	6.92 (5.72–8.38)	4.91 (3.97–6.08)
	Unknown	1 069		
Drugs for sleeping difficulties	No	10 189	1.00	1.00
	Yes	2 209	2.33 (2.11–2.58)	1.85 (1.65–2.09)
	Unknown	495		
Drugs for 'nerves'	No	10 910	1.00	1.00
	Yes	1 456	2.33 (2.07–2.62)	1.48 (1.28–1.71)
	Unknown	527		

HX, hysterectomy; OX, oophorectomy.
* adjusted for all variables in the model

Table 4. Use of and reported levels of satisfaction with services available to women who reported constipation and hemorrhoids

		(a) % reporting symptom	(b) % of (a) seeking help	(c) % of (b) satisfied with help
Young women (n = 14 761)	Constipation n = 14 659	14.1	35.4	67.3
	Hemorrhoids n = 14 659	3.2	43.4	70.2
Middle-aged women (n = 14 070)	Constipation n = 13 910	26.6	50.2	84.9
	Hemorrhoids n = 13 900	17.7	57.2	86.6
Older women (n = 12 893)	Constipation n = 11 918	27.7	51.7	85.2
	Hemorrhoids n = 11 824	18.3	54.2	86.0

older cohort. Almost 30% of the middle-aged and older women reported experiencing constipation 'sometimes or often'. The results also suggest that the prevalence of constipation is higher in these Australian cohorts than in previous US studies [6,7,9].

As in previous reports [18,25], women in the younger cohort with children were more likely to report constipation. There was, however, no 'dose response' between parity and constipation; however, the small number of young women with two or more children might partly explain this finding. The finding that parity was not associated with constipation in the middle-aged and older women suggests that other factors that occur later in life, and which are known to be associated with parity (such as gynecologic surgery, pelvic organ prolapse and hemorrhoids), may mask any effects of parity on constipation in older women.

The association between constipation and gynecologic surgery is clearly seen in this study, particularly in the middle-aged cohort. These findings support previous work suggesting that any damage to the pelvic floor, as a result of either childbirth or gynecologic surgery, has the potential to disrupt normal functioning of the muscles that control both urination and defecation [17,19,26]. Earlier analyses of data from the Women's Health Australia Project suggest that the prevalence of leaking urine is significantly higher among women in all three cohorts who also report constipation [27]. Moreover, the data suggest that the use of HRT and other medications which are commonly prescribed for women is also associated with constipation.

In this study there was a strong association in every age cohort between hemorrhoids and constipation, and between 'other bowel problems' and constipation. Although we assume that 'other bowel problems' would include problems such as irritable bowel, abdominal bloating, diarrhea and rectal bleeding, the strong association between constipation and 'other bowel problems', especially in the young cohort, probably reflects a lack of differentiation between constipation and 'other bowel problems'. The sequence of onset of the symptoms and events included in the regression models is not clear from these cross-sectional data. However, the WHA study will have the capacity to explore the time sequence of events such as childbirth, gynecologic surgery and the development of constipation, hemorrhoids, prolapse and the need for prolapse repair, once longitudinal data are available.

The finding that only around half the middle-aged and older women (and fewer of the young women) who experienced constipation or hemorrhoids reported having sought help for these problems, suggests that whereas some women see these issues as problems that require assistance, many others do not, or are too embarrassed to seek help. As there was no mention of constipation in the large GP survey of 1990–91 [11], it may be true that most help for these problems is in the form of over-the-counter self-help remedies such as laxatives, suppositories or creams. The results do suggest, however, that women are largely satisfied with the help available to them for management of these problems.

Notwithstanding this satisfaction, it may be more beneficial to address prevention, rather than management of these problems, because in the long term prevention may reduce the need for surgery for removal of hemorrhoids and prolapse repair. One approach would be for all patients presenting to health services for pregnancy care or gynecologic surgery to receive information about the risk of constipation and strategies for its prevention, including fiber and fluid intake, physical activity, pelvic floor conditioning exercises, and a review of medications. A recent Australian study found that 84% of Australian women regard pregnancy as an acceptable time for the promotion of good bowel habits [28]. A secondary strategy might be to provide point-of-sale information about the associations between medications and constipation.

Although constipation is not associated with mortality, it is prevalent and burdensome to those it affects, and the financial costs of its sequelae are great. Each of the factors identified in this study as being associated with constipation is also associated with dysfunction of the pelvic floor muscles. Further research is required to assess the importance of these muscles for the prevention of constipation and its long-term consequences.

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EDITORIAL COMMENT: The authors present important data obtained from a large national survey of Australian women which evaluated the association between constipation and a limited number of factors thought to influence bowel symptoms. The strength of the study is the large number of women sampled from different age cohorts. However, the response rate (37% in the older group) is poor and severely limits the generalizability of these findings. In addition, the subjectivity inherent in the definition of constipation may be exacerbated by the scale of the primary dependent variables of 'sometimes' and 'often'. This may have resulted in significant overlap and increased variability.