Prevalence and correlates of three types of pelvic pain in a nationally representative sample of Australian women

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ABSTRACT

Objective: To identify the prevalence and correlates of three types of pelvic pain (dysmenorrhoea, dyspareunia, and other chronic pelvic pain [CPP]) in a nationally representative sample of Australian women.

Design and setting: The CPP survey was part of a broader national study of health and relationships. Computer-assisted telephone interviews were administered to a random sample of 8656 Australian households; 4366 women aged between 16 and 64 years were interviewed in 2004 and 2005. Eighteen of the more than 200 potential survey questions related to pelvic pain.

Main outcome measures: Self-reports of dysmenorrhoea, dyspareunia, and any other CPP not associated with sexual intercourse or menstruation.

Results: Data on 1983 women aged 16–49 years who were still menstruating and sexually active were analysed. Prevalences were 71.7% for dysmenorrhoea, 14.1% for dyspareunia and 21.5% for other CPP; 23.3% of women reported no pelvic pain of any kind. Severe pain was reported by 15.0% (95% CI, 13.0%–17.1%) of women with dysmenorrhoea, 7.8% (95% CI, 5.0%–11.9%) of women with dyspareunia and 20.0% (95% CI, 16.1%–24.6%) of women with other CPP. Just over a third (34.2%) of women who reported any pain had sought advice from a health professional. Women reporting CPP were also likely to report other health conditions, most notably depression and anxiety. There were clear associations between CPP and sexual difficulties, pregnancy and pregnancy outcomes.

Conclusions: Rates of pelvic pain in Australian women are high. General practitioners need to be ready to discuss these issues with patients, particularly in relation to underlying anxiety and depression.

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A recent systematic review by the World Health Organization identified chronic pelvic pain (CPP) as an important cause of morbidity in women, but noted that the condition is relatively neglected because of the paucity of basic epidemiological data.[1]

There have been few population-based studies of CPP. A United States study reported a CPP prevalence of 14.7% among women aged 18–50 years,[2] but the study excluded mid cycle period pain. Two other studies that did include mid cycle pain, one in the United Kingdom and the other in New Zealand, reported CPP prevalences of 24% and 25.4%, respectively.[3,4] A recent systematic review evaluating 54 risk factors for dysmenorrhoea identified a number of factors associated with dysmenorrhoea, including age (< 30 years), low body mass index, smoking, early menarche, long menstrual cycles, heavy menstrual flow, nulliparity, premenstrual syndrome, sterilisation, clinically suspected pelvic inflammatory disease, sexual abuse and psychological symptoms.[5] There was an inverse relationship between dysmenorrhoea and younger age at first childbirth, exercise, and the use of oral contraceptives. In the same study, menopause, pelvic inflammatory disease, sexual abuse, anxiety and depression were found to be associated with dyspareunia. Drug or alcohol misuse, miscarriage, heavy menstrual flow, pelvic inflammatory disease, previous caesarean section, pelvic pathology, abuse, and psychological comorbidity were associated with an increased risk of non-cyclical pelvic pain.

Our study reports on the first population-based study of pelvic pain in Australia and identifies correlates with other health conditions and women's sexual and reproductive histories.

METHODS

Design of principal study

The Australian Longitudinal Study of Health and Relationships is a representative population-based survey of the sexual health behaviour, attitudes and knowledge of the Australian population. It is based on a random sample of Australians aged 16–64 years who completed a computer-assisted telephone interview. The first annual data collection panel was conducted in 2004–2005. A sample of 8656 households was drawn using random-digit dialling, as described in an earlier study.[6] In half of the sample households, a woman was selected. Where possible, phone numbers were matched with addresses in the electronic White Pages phone directory, and an introductory letter detailing the study was posted to households. Otherwise, respondents were informed of the nature of the study over the phone. Before being interviewed, participants provided informed consent. If more than one household member was eligible, a single participant was chosen at random by a computer-generated algorithm. Prevalence data for our study come from the first panel of interviews.

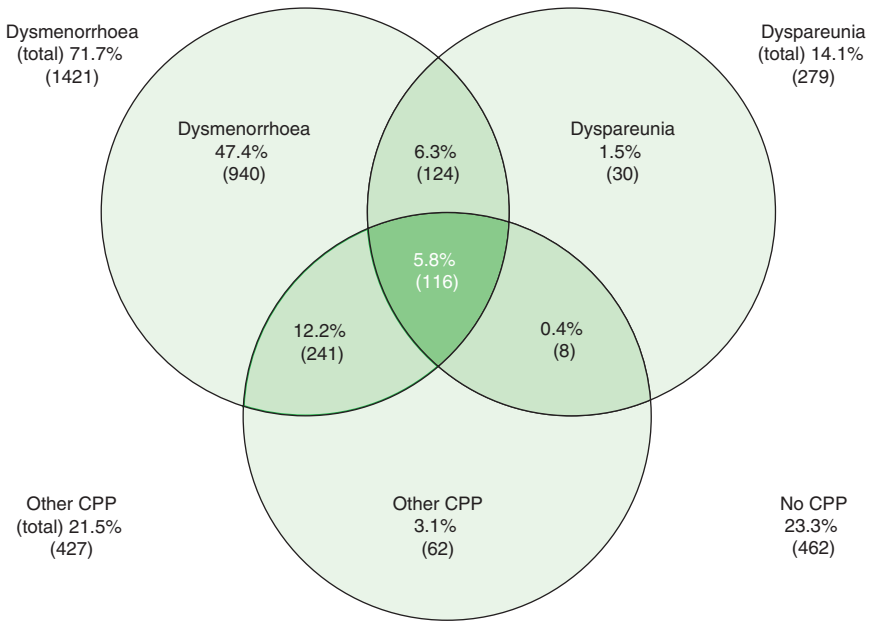
Our report on pelvic pain in women is based on a subset of data gathered for the broader longitudinal study of health and relationships. The subset comprised sexually active women between the ages of 16 and 49 years, interviewed in 2004 and 2005. Of the more than 200 potential survey questions, 18 related to pelvic pain.

Survey items and definitions

Women were asked whether or not they had experienced pain in the pelvic region (dysmenorrhoea, dyspareunia, or any other pelvic pain not associated with sexual intercourse or menstruation) during the previous 12 months. Pelvic pain was defined as "any type of pain in the lower part of your belly — that is, from your belly button down". Three subtypes of pelvic pain where defined as follows:

- *Dysmenorrhoea* was defined as "pelvic pain with periods, including irregular bleeding while on the pill or on hormone replacement therapy";

1 Prevalence of dysmenorrhoea, dyspareunia and other chronic pelvic pain (CPP) among 1983 women over a 12-month period*



*Women included in the sample were those aged 16–49 years who were currently menstruating and sexually active. ◆

- *Dyspareunia* was defined as "pelvic pain during or in the 24 hours after intercourse"; and
- *Other CPP* was defined as "pelvic pain not occurring with periods or intercourse, either on and off or constantly".

Women who had experienced any CPP were asked to rate the typical severity of pain as "slight", "mild", "moderate" or "severe".

Participants

Women who were eligible for our study were those aged between 16 and 49 years who reported menstruating in the previous 12 months and were sexually active. In line with earlier studies,[2,4] women aged 50 years or over were excluded because of the potential confounding effects of menopause. Women who were currently pregnant (n = 106*) or who had been pregnant in the previous 12 months (n = 269*) were also excluded. (* Note that all counts, here and elsewhere, were weighted for each sex with respect to household size and rounded to the nearest integer.)

Methods of analysis

As the three CPP outcomes were dichotomous (yes/no) variables, logistic regression models were used, with all exploratory variables (eg, age, rurality, sexual history and pregnancy outcomes) entered individually. Analyses for the three outcomes variables were performed separately, with adjustment for age in each model. Data were analysed using Stata software, version 10 (StataCorp, College Station, Tex, USA) and the program's survey-based function. Confidence levels for the odds ratios were set at 95%.

Ethical approval

Our study was approved by the human research ethics committees of La Trobe University, the University of New South Wales and Deakin University.

RESULTS

We interviewed 4366 women, representing a response rate of 57% for female participants. Results presented here relate to the 1983 women between the ages of 16 and 49 years who reported menstruating in the previous 12 months and who were sexually active.

Prevalence of CPP and demographic factors

Prevalences of the three types of CPP were 71.7% (n = 1421) for dysmenorrhoea, 14.1% (n = 279) for dyspareunia, and 21.5% (n = 427) for other CPP. Only 23.3% (n = 462) of our sample reported no pelvic pain of any kind (Box 1). Box 1 also shows the overlap between dysmenorrhoea, dyspareunia and other CPP.

Different kinds of pelvic pain were experienced with differing degrees of severity. Severe pain was reported by 15.0% (95% CI, 13.0%–17.1%) of women with dysmenorrhoea, 7.8% (95% CI, 5.0%–11.9%) of women with dyspareunia, and 20.0% (95% CI, 16.1%–24.6%) of women with pelvic pain not associated with dyspareunia or dysmenorrhoea. Of women who reported dyspareunia, more than half (54.5%) reported it as only slight or mild. In contrast, of women who reported other CPP, 38.3% reported it as only slight or mild. Just over a third of women (34.2%) who reported any type of pelvic pain had sought advice from a health professional.

An age effect was observed for women reporting dysmenorrhoea and dyspareunia but not other CPP (Box 2): compared with women aged 40–49 years, women in younger age groups were significantly more likely to report dysmenorrhoea or dyspareunia. However, a test of the changes in the proportion of women experiencing pelvic pain across the age range was not significant. Given the pronounced age effect for dysmenorrhoea and dyspareunia observed in previous research, we controlled for respondents' age in all further analyses.

Women reporting dysmenorrhoea were more likely to speak English at home than women without dysmenorrhoea. Women reporting dyspareunia were more likely to have an educational attainment of secondary school level or less. Among women reporting other CPP, there were no significant demographic differences (Box 2).

Sexual difficulties

Compared with women who had no pelvic pain, women with any type of pelvic pain were more likely to report having some form of sexual difficulty for at least a month during the previous 12 months (Box 3). For example, women in all three groups were significantly more likely to have experienced physical pain during sex and/or a lack of interest in sex during the previous 12 months; and women with dyspareunia or other CPP were significantly more likely to report anxiety about sex and/or vaginal dryness. Women reporting dyspareunia were more likely to be unable to achieve orgasm, and experienced more sexual difficulties than other women overall.

Compared with women with no pelvic pain, those reporting dyspareunia (but not the other types of CPP) were significantly more likely to have had sex during the 4 weeks prior to the

2 Demographic correlates of three types of pelvic pain

		Dysmenorrhoea		Dyspareunia		Other CPP	
	Number of women*	"Yes" responses (%)	OR† (95% CI)	"Yes" responses (%)	OR† (95% CI)	"Yes" responses (%)	OR† (95% CI)
Age (years)							
16–19	159	83.8%‡	2.74 (1.49–5.04)	19.4%	2.38 (1.32–4.29)	21.5%	1.06 (0.62–1.82)
20–29	450	74.8%	1.58 (1.18–2.12)	16.7%	1.98 (1.35–2.90)	21.9%	1.08 (0.78–1.50)
30–39	638	73.7%	1.49 (1.18–1.89)	16.5%	1.95 (1.40–2.72)	22.5%	1.12 (0.86–1.46)
40–49§	736	65.3%	1.0	9.2%	1.0	20.5%	1.0
Heterosexual relationship¶							
Yes	1691	70.9%	0.92 (0.65–1.31)	14.3%	1.37 (0.87–2.15)	21.6%	1.02 (0.70–1.48)
No§	292	76.0%	1.0	12.9%	1.0	21.4%	1.0
Educational status							
Less than secondary	430	71.5%	1.06 (0.78–1.44)	15.3%	1.55 (1.04–2.30)	21.1%	0.98 (0.70–1.38)
Secondary	989	72.8%	1.12 (0.87–1.43)	15.3%	1.45 (1.04–2.03)	21.7%	1.01 (0.77–1.33)
Tertiary§	564	69.7%	1.0	10.9%	1.0	21.6%	1.0
Employment status							
None§	478	71.7%	1.0	16.6%	1.0	19.0%	1.0
Part-time	754	70.1%	0.96 (0.73–1.26)	11.6%	0.70 (0.49–0.99)	22.3%	1.24 (0.92–1.67)
Full-time	750	73.2%	1.11 (0.84–1.46)	14.9%	0.89 (0.63–1.26)	22.4%	1.23 (0.91–1.66)
Region of residence**							
City§	1030	71.6%	1.0	14.0%	1.0	20.3%	1.0
Regional	847	71.1%	0.98 (0.78–1.22)	13.5%	0.98 (0.73–1.30)	22.7%	1.17 (0.92–1.49)
Remote	82	79.6%	1.66 (0.97–2.83)	17.3%	1.39 (0.74–2.60)	22.4%	1.15 (0.66–2.00)
Language spoken at home							
English	1898	72.4%	2.02 (1.21–3.38)	14.1%	1.01 (0.51–2.02)	21.8%	1.63 (0.63–4.20)
Other§	85	55.9%	1.0	13.7%	1.0	14.7%	1.0

CPP = chronic pelvic pain. OR = odds ratio. * Numbers were weighted for each sex with respect to household size and rounded to the nearest integer. † ORs were adjusted for age. ‡ An example of how to interpret percentages in table: 83.8% of the 159 women aged 16–19 years responded "yes" to the question of whether they had experienced dysmenorrhoea during the previous 12 months. § Reference category. ¶ In a heterosexual relationship currently or within previous 12 months. ** Based on the Australian Standard Geographical Classification.[7] ◆

interview and were more likely to have had sex more frequently (Box 3).

Contraceptive practices

Women who reported dysmenorrhoea were significantly less likely to be using oral contraception or any form of contraception (data not shown). Women reporting dyspareunia or other CPP were significantly more likely to have ever used emergency contraception.

Pregnancy and pregnancy outcomes

Relationships between pregnancy outcomes and the three types of CPP are summarised in Box 4. Compared with women who had never been pregnant, those who had ever been pregnant were significantly less likely to report dysmenorrhoea but more likely to report dyspareunia. There was no significant association between pregnancy and other CPP. Women who had had a live birth or a termination were significantly less likely to report dysmenorrhoea.

Compared to women with no dyspareunia, women reporting dyspareunia were significantly more likely to have had two or more pregnancies and to have had a miscarriage or termination. The data suggest that women who have had two or more terminations are more likely to experience dyspareunia. For women reporting other CPP there were no significant patterns of association with pregnancy history (Box 4).

Other health conditions

A number of lifestyle and health conditions were analysed for associations with pelvic pain (data not shown). Women who had ever been diagnosed with depression or who had experienced a lot of anxiety over the previous 4 weeks were significantly more likely to report any form of pelvic pain. (As the anxiety question included depression as one of the options for emotional problems, depression was added as a covariate to mediate any collinear effects.)

Women reporting dysmenorrhoea were significantly more likely to be a current drinker, and women who reported dyspareunia were more likely to have a heart condition and to be a current smoker. Women reporting other CPP were significantly more likely to have a heart condition.

There was no significant association between CPP and a range of other factors, including diabetes, high blood pressure, body mass index and binge drinking.

DISCUSSION

The key finding of our study was the high prevalence of the three types of pelvic pain, with only one in four participants reporting

3 Sexual difficulty correlates of three types of pelvic pain

	Number of women*	Dysmenorrhoea "Yes" responses (%)	Dysmenorrhoea OR† (95% CI)	Dyspareunia "Yes" responses (%)	Dyspareunia OR† (95% CI)	Other CPP "Yes" responses (%)	Other CPP OR† (95% CI)
Had sex in past 4 weeks							
No‡	312	72.5%	1.0	9.6%	1.0	20.3%	1.0
Yes	1645	71.3%§	1.03 (0.75–1.41)	15.0%	1.80 (1.16–2.80)	21.7%	1.09 (0.76–1.57)
Frequency of sex in past 4 weeks							
No sex‡	312	72.5%	1.0	9.6%	1.0	20.3%	1.0
Less than once a week	488	71.3%	1.03 (0.72–1.48)	11.8%	1.37 (0.82–2.28)	25.3%	1.34 (0.89–2.00)
Once a week	502	71.1%	1.04 (0.72–1.50)	15.0%	1.83 (1.11–3.00)	20.3%	1.00 (0.66–1.51)
Two to three times a week	488	72.8%	1.13 (0.78–1.62)	15.4%	1.88 (1.15–3.08)	19.1%	0.93 (0.61–1.41)
Four to six times a week	105	65.9%	0.74 (0.44–1.25)	27.8%	3.65 (1.96–6.82)	24.6%	1.27 (0.71–2.26)
More than once a day	30	69.4%	0.81 (0.32–2.06)	27.8%	3.43 (1.39–8.49)	19.4%	0.93 (0.37–2.33)
During the past 12 months has there been a period of 1 month or more when you:							
Lacked interested in sex							
No‡	1069	69.2%	1.0	11.2%	1.0	17.5%	1.0
Yes	914	74.5%	1.31 (1.05–1.62)	17.4%	1.69 (1.28–2.23)	26.3%	1.68 (1.33–2.13)
Were anxious about sex							
No‡	1736	70.8%	1.0	12.6%	1.0	20.7%	1.0
Yes	248	77.8%	1.37 (0.97–1.96)	23.9%	2.07 (1.44–2.97)	27.6%	1.46 (1.05–2.01)
Were unable to orgasm							
No‡	1615	71.0%	1.0	12.5%	1.0	20.6%	1.0
Yes	342	74.6%	1.19 (0.89–1.60)	21.0%	1.84 (1.33–2.56)	25.4%	1.31 (0.98–1.75)
Were quick to orgasm							
No‡	1849	71.1%	1.0	14.0%	1.0	21.1%	1.0
Yes	108	80.0%	1.66 (1.01–2.75)	13.8%	1.00 (0.58–1.74)	27.7%	1.44 (0.91–2.28)
Had physical pain during sex							
No‡	1777	70.4%	1.0	10.1%	1.0	20.4%	1.0
Yes	199	82.4%	1.74 (1.14–2.66)	49.8%	8.43 (5.84–12.19)	32.2%	1.86 (1.30–2.66)
Had vaginal dryness							
No‡	1784	71.7%	1.0	12.9%	1.0	20.9%	1.0
Yes	199	71.5%	1.04 (0.73–1.47)	24.3%	2.31 (1.59–3.36)	27.6%	1.46 (1.02–2.07)

CPP = chronic pelvic pain. OR = odds ratio. * Numbers were weighted for each sex with respect to household size and rounded to the nearest integer. † ORs were adjusted for age. ‡ Reference category. § An example of how to interpret percentages in table: 71.3% of the 1645 women who had had sex in the past 4 weeks responded "yes" to the question of whether they had experienced dysmenorrhoea during the previous 12 months. ◆

no pelvic pain. With 71.7% of women reporting dysmenorrhoea, this condition can clearly be considered to be the norm for Australian women.

As observed in previous studies,[2,4] we found a significant association between age and pelvic pain, with women aged 40–49 years reporting lower prevalences of dysmenorrhoea and dyspareunia than younger women. The 83.8% prevalence of dysmenorrhoea among women aged 16–19 years in our study was similar to the 80% prevalence noted in a Western Australian study of female senior secondary students.[8] More than one in five women (21.5%) in our study reported other CPP, which is similar to the 24% reported by Zondervan et al[3] in the UK and the 25.4% reported by Grace and Zondervan[4] in NZ. However, Zondervan and colleagues sampled from a community clinic and Grace and Zondervan used a postal survey. Both methods may include a response bias towards women interested in, or relating to, CPP. By contrast, our survey incorporated many different aspects of health and wellbeing, of which pelvic pain was just one aspect.

Physical pain during intercourse and lack of interest in sex were commonly reported among all three groups of women in our survey. Those reporting dyspareunia had the most sexual difficulties — in spite of (or perhaps partly because of) the fact that they were more likely to report having sex during the previous 4 weeks and to report having more frequent sex than women without dyspareunia.

For women in our study, the overall prevalence of dyspareunia was 14.1%. This is higher than the 9.3% prevalence found in women attending a cervical screening program in Sweden.[9] Although a direct comparison between our study and the Swedish study was not possible for all individual age groups, for women aged 20–29 years, the

4 Pregnancy outcome correlates of three types of pelvic pain

		Dysmenorrhoea		Dyspareunia		Other CPP	
	Number of women*	"Yes" responses (%)	OR† (95% CI)	"Yes" responses (%)	OR† (95% CI)	"Yes" responses (%)	OR† (95% CI)
Ever been pregnant							
No‡	666	78.1%	1.0	14.9%	1.0	21.2%	1.0
Yes	1317	68.4%§	0.74 (0.55–0.99)	13.6%	1.46 (1.01–2.11)	21.7%	1.11 (0.81–1.52)
Number of times pregnant							
0‡	666	78.1%	1.0	14.9%	1.0	21.2%	1.0
1	188	72.6%	0.82 (0.56–1.22)	12.8%	1.11 (0.66–1.87)	24.3%	1.23 (0.80–1.87)
2	403	65.8%	0.65 (0.46–0.91)	14.1%	1.60 (1.03–2.49)	19.7%	0.96 (0.66–1.40)
⩾3	726	68.7%	0.76 (0.55–1.05)	13.6%	1.67 (1.09–2.56)	22.2%	1.14 (0.80–1.61)
Ever had a live birth							
No‡	765	77.6%	1.0	15.6%	1.0	21.4%	1.0
Yes	1218	67.9%	0.74 (0.56–0.97)	13.1%	1.23 (0.87–1.73)	21.6%	1.07 (0.81–1.43)
Number of live births							
0‡	765	77.6%	1.0	15.6%	1.0	21.4%	1.0
1	208	67.6%	0.70 (0.49–0.99)	12.8%	1.07 (0.67–1.71)	22.4%	1.09 (0.75–1.60)
2	561	70.4%	0.82 (0.60–1.12)	14.4%	1.37 (0.93–2.01)	23.3%	1.17 (0.85–1.60)
⩾3	449	64.9%	0.66 (0.47–0.92)	11.5%	1.15 (0.73–1.82)	19.2%	0.92 (0.64–1.33)
Ever had a miscarriage							
No‡	1582	71.4%	1.0	13.6%	1.0	20.8%	1.0
Yes	401	72.6%	1.28 (0.99–1.66)	15.8%	1.54 (1.11–2.13)	24.5%	1.29 (0.98–1.71)
Number of miscarriages							
0‡	1582	71.4%	1.0	13.6%	1.0	20.8%	1.0
1	269	70.9%	1.17 (0.87–1.58)	16.1%	1.56 (1.07–2.27)	22.9%	1.18 (0.85–1.64)
2	79	78.9%	1.81 (1.06–3.11)	12.6%	1.17 (0.62–2.22)	27.4%	1.50 (0.90–2.49)
⩾3	53	71.4%	1.26 (0.66–2.42)	19.0%	2.09 (0.95–4.63)	28.6%	1.61 (0.82–3.16)
Ever had a termination							
No‡	1700	72.9%	1.0	13.2%	1.0	21.4%	1.0
Yes	284	64.4%	0.73 (0.55–0.96)	19.1%	1.74 (1.24–2.44)	22.6%	1.08 (0.79–1.48)
Number of terminations							
0‡	1700	72.9%	1.0	13.2%	1.0	21.4%	1.0
1	212	62.2%	0.66 (0.48–0.90)	15.4%	1.32 (0.87–1.99)	22.0%	1.04 (0.74–1.48)
2	53	70.3%	0.96 (0.53–1.73)	29.7%	3.19 (1.75–5.81)	28.1%	1.45 (0.74–2.83)
⩾3	18	72.7%	1.12 (0.39–3.24)	31.8%	3.78 (1.44–9.93)	13.6%	0.59 (0.12–2.78)

CPP = chronic pelvic pain. OR = odds ratio. *Numbers were weighted for each sex with respect to household size and rounded to the nearest integer. †ORs were adjusted for age. ‡Reference category. §An example of how to interpret percentages in table: 68.4% of the 1317 women who reported ever being pregnant responded "yes" to the question of whether they had experienced dysmenorrhoea during the previous 12 months. ◆

prevalence was 16.7% in our study compared with 13% in the Swedish study.

Strengths of our study were its large sample size and wide age range. Additionally, the sample was population-based rather than clinic-based. Potential weaknesses included the reliance on self-report and the relatively low response rate. In mitigation of the low response rate, it is noteworthy that the prevalences of most key outcomes in sexual and reproductive health in our study were almost exactly the same as those reported in the previous national Australian study, which had a 73% response rate (data not shown).[6]

Our findings lend further support to the findings of a review by Latthe et al of factors predisposing women to CPP.[1] That review pointed to the inter-relationship between risk factors — for example, that a history of abuse is strongly associated with depression, and that both factors are, in turn, associated with CPP. Given the longitudinal nature of our study, analysis of further waves of data may shed light on the nature of causal relationships between these and other risk factors. Only a quarter of the studies evaluated by Latthe et al[1] (which were predominantly case–control studies) examined the temporal relationship between risk factors and CPP. Further areas in need of research include a comprehensive understanding of the natural history of pelvic pain and strategies for its effective treatment and management.

In conclusion, rates of pelvic pain in Australia are high. Yet our findings suggest

that only about a third of women who experience CPP seek advice from a health professional. General practitioners need to be aware of the prevalence of different types of CPP and to be ready to discuss these issues with patients, particularly in relation to underlying anxiety and depression.

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COMPETING INTERESTS

None identified.

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