



## Observational study

# Female chronic pelvic pain is highly prevalent in Denmark. A cross-sectional population-based study with randomly selected participants

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## HIGHLIGHTS

- A cross-sectional study of female chronic pelvic pain (CPP) in Denmark.
- The prevalence of CPP was 11% in women  $\geq 18$  years; 13.6% in women aged 18–49 years.
- CPP of a moderate to severe intensity was prevalent in 6.2% of the included women.
- Four factors independently associated with female CPP were identified.
- Factors were age  $\leq 49$  years, country of birth, former pelvic trauma and pelvic surgery.

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## ABSTRACT

**Background and purpose:** Female chronic pelvic pain is a significant clinical problem that burdens the health care services and work productivity, and leads to disability and reduced quality of life among the women affected. A recent systematic review reported worldwide prevalence rates for female chronic pelvic pain ranging from 2.1% to 24%. Our aim was to assess the prevalence, characteristics, and factors associated with chronic pelvic pain among women living in Denmark, and to compare these findings with a pain-free reference group. Secondly, we evaluated the impact of pain on daily life in women suffering from chronic pelvic pain.

**Methods:** A cross-sectional postal survey of the prevalence of chronic pelvic pain was undertaken in a randomly selected general female population in Denmark ( $N = 2500$ ). Inclusion criteria were: (a)  $\geq 18$  years of age and (b) living in the Capital region or the region of Zealand in Denmark. Statistical analyses included prevalence percentage rates, chi-square tests, Mann–Whitney tests, and unpaired *T*-tests. Logistic regression analysis was used to identify the significant independent variables and to estimate their simultaneous impact on chronic pelvic pain. The results were expressed as odds ratio and 95% confidence intervals. All tests were two-tailed and significance levels were set at  $p < 0.05$ .

**Results:** 1179 (48%) women living in representative areas of Denmark responded. The prevalence of chronic pelvic pain was 11% ( $n = 130$ ) in women  $\geq 18$  years with a prevalence of 13.6% ( $n = 87$ ) in women of reproductive age; 6.2% ( $n = 73$ ) women experienced at least moderate average pain intensity (numerical rating scale  $\geq 4$ ). Self-reported diagnosis of irritable bowel syndrome (20%), bladder pain syndrome/interstitial cystitis (3%), vulvodynia (9%), endometriosis (8%), and pelvic surgery in the preceding 6 months (5%) were more prevalent in cases compared to pain-free reference subjects ( $p = 0.00$ ). Chronic pelvic pain interfered with daily life “all the time” in 5% of the women, “sometimes” in 72.3%, and “not at all” in 22.7%. Factors independently associated with chronic pelvic pain were age, country of birth, and former pelvic trauma or pelvic surgery ( $p < 0.05$ ). No association was found between chronic pelvic pain and selected socio-demographic factors (residential area, educational level, cohabitation status and employment status).

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**Conclusions:** Female chronic pelvic pain appears highly prevalent (11%) in Denmark (6.2% with moderate to severe pain). Women of reproductive age had a slightly increased prevalence (13.6%). Although the reported prevalence is based on 48% ( $N = 1179$ ) of the invited sample, dropout analyses found that respondents did not deviate from non-respondents. Therefore, we considered the reported prevalence rate representative for the total sample and generalisable to the general female population in Denmark. This study was cross-sectional, and relied on association-based analyses. Consequently, causality between age groups, country of birth, former pelvic surgeries and pelvic traumas and experiences of chronic pelvic pain remains unknown.

**Implications:** In order to improve prevention and treatment of chronic pelvic pain in Denmark, high quality, population-based cohort studies and randomised clinical trials are essential. The demand for trustworthy chronic pelvic pain prevalence estimates might also inspire political attention and hereby facilitate funding for further development of treatment and research.

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## 1. Introduction

Chronic pelvic pain (CPP) is a common cause of disability and reduced quality of life in women in the Western world. The International Association for the study of pain (IASP) defines CPP as chronic or persistent pain for at least 6 months duration perceived in structures related to the anatomic pelvis, and often associated with negative cognitive, behavioural, sexual and emotional consequences, as well as with symptoms suggestive of lower urinary tract, sexual, bowel, pelvic floor or gynaecological dysfunction. Cyclical pain is included (dysmenorrhoea) if it is persistent and associated with the above-mentioned consequences [1,2].

In a retrospective primary care database study the most commonly cited annual prevalence rate of female CPP with multisystem aetiology (visceral, somatic, psycho-neurological) was 3.8% in women aged 12–70 years [3]. Other population-based studies have reported prevalence rates ranging from 11.5% to 25.4% [4–8]. These high prevalence rates were confirmed in a recent systematic review of worldwide female CPP [9]. However, inconsistent diagnostic criteria for CPP and heterogeneity in methods and designs of previous epidemiological studies contribute to the substantial variation in prevalence estimates. This is problematic, as valid information on CPP prevalence is prerequisite for national resource allocation and health care planning. No recent data are available on the economic burden of CPP on healthcare systems. In the USA (1996), the total direct annual health care costs for physician visits plus out-of-pocket expenses for CPP were estimated at \$2.8 billion per year [5]. Female CPP accounts for 10% of consultations in primary care [3,5] and up to 40% of all gynaecological visits [5,10,11]. Abdominal and pelvic pain is the main indication for 34% of diagnostic laparoscopies [12] and 7% of hysterectomies performed for benign diseases in the USA and Denmark [13,14]. In Western countries, epidemiological studies have provided inconsistent results regarding the association between female CPP and socio-demographic factors (economic-, educational-, occupational-, ethnic and cohabitation status) [5,6,8,11]. Consequently, the evidence for a direct association between these factors and female CPP remains inconclusive. However, recent Scandinavian studies have suggested that socio-demographic characteristics (female sex, older age, low income and low educational level, and being divorced or separated) are associated to chronic pain conditions, although not specifically related to CPP [15,16,17].

### 1.1. Objectives

To our knowledge the prevalence of female CPP in Denmark and associated clinical and socio-demographic factors remains uninvestigated. We aimed to provide primary information on the prevalence rate, pain characteristics and factors potentially associated with CPP. Secondly, we aimed to evaluate the impact of pain on daily life in women suffering from CPP.

## 2. Methods

### 2.1. Participants and procedure

We undertook a population-based cross-sectional postal survey of the prevalence of CPP among 2500 randomly selected women living in Denmark. Between November 2010 and April 2011, we mailed study information, an invitation to participate, and a questionnaire on CPP together with a prestamped return envelope to potential participants. Potential participants were randomly selected by a computer-program and identified by date of birth, name and address through the Central Office of Civil Registration, in which all inhabitants in Denmark are registered. Inclusion criteria were: (a) female, (b)  $\geq 18$  years of age, and (c) living in the Capital region or the region of Zealand in Denmark. The population in this area includes approximately 2.52 million inhabitants [18]. Non-respondents received a reminder within 5 weeks after the first mailing.

### 2.2. Definition of CPP

We defined CPP as chronic or persistent pain for at least 6 months duration perceived (by the subject) in structures related to the anatomic pelvis. This definition is somewhat broader than the definition provided by IASP which includes a clinical validation of the pain as originating from the specified anatomical pelvic area [19]. Alternatively, identification of CPP was completed with a body map and a body scheme that visually and verbally specified the localisation to the anatomic pelvis, the anterior abdominal wall at or below the umbilicus, the lumbosacral back, or the buttocks [20].

### 2.3. Questionnaire

Initially, we developed and undertook a classic stepwise validation of a self-reported questionnaire on experiences of CPP (data available from the corresponding author). The questionnaire consisted of 18 questions; the first part (items 1–7) obtained information on background variables (age, socio-demographic characteristics, pregnancies/children, and self-reported pelvic diagnoses); the second part (items 8–14) included specific questions about CPP: location, frequency, pain intensity, use of pain medication and influence of CPP on daily life; and finally, the third part (items 15–18) included questions about former pelvic trauma, former pelvic surgery, and presence of dyspareunia (painful sexual intercourse). The Danish National Institute of Public Health informed the questionnaire items on socio-demographic background variables [21]. We identified respondents with experiences of CPP with the following question “Do you have chronic/longstanding pain in the pelvic area or lower abdomen, i.e. constant or recurrent pain lasting 6 months or more?” [22]. Positive respondents differentiated frequencies of CPP into

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