

# Chronic pelvic pain in Spanish women: prevalence and associated risk factors. A cross-sectional study

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## Summary

**Objective:** To determine the prevalence of chronic pelvic pain (CPP) symptoms and associated risk factors in Spanish women. **Design:** A cross-sectional study. **Setting:** in Malaga and its province in Spain. **Population:** women aged 18-65 years using non-probability sampling by quotas (n = 940), stratified by age and county. **Materials and Methods:** All the participants completed the CPPQ-Mohedo, a self-administered validated questionnaire able to discriminate between patients with and without CPP. **Results:** Taking a CPPQ-Mohedo score of  $\geq 6$  as an indication of CPP symptoms, the prevalence of CPP symptoms was 26.8% in the general population in women aged 18-65 years. After adjustment for age, those women who exercised had a lower CPPQ-Mohedo score than those who did not exercise (mean difference  $-3.02 \pm 4.27$ ). Higher (worse) scores were associated with the following factors: lifting and/or moving heavy loads during activities of daily living ( $3.57 \pm 4.51$ ), laxatives and/or a high-fiber diet ( $4.71 \pm 5.07$ ), history of recurrent urogenital infection (vulvovaginitis, cystitis;  $4.40 \pm 5.22$ ), pelvic trauma ( $4.77 \pm 4.55$ ), irritable bowel ( $5.10 \pm 5.50$ ), anal fissure ( $7.46 \pm 6.50$ ) or uterine prolapse ( $13.66 \pm 2.36$ ). **Conclusions:** The prevalence of CPP symptoms in Spanish women is high and is associated with risk factors that should be addressed by multidisciplinary preventive, diagnostic, and therapeutic strategies. More prevalence studies are needed to determine the true situation concerning chronic pelvic pain in Spain.

**Key words:** Chronic pelvic pain; Prevalence; Risk factors; Urogenital infection; Uterine prolapse.

## Introduction

Chronic pelvic pain (CPP) is generally defined as pain in the lower abdomen, pelvis or intrapelvic structures, lasting at least three to six months, which presents either continuously or intermittently, and in women is not associated exclusively with the menstrual cycle or pregnancy [1-2]. Although CPP affects 10-16% of men, with a greater frequency in the age range of 36-50 years [3], epidemiologically it has a higher incidence in women [4]. In the UK, an annual prevalence in primary care of 38/1,000 was found in women aged 15-73 years, a rate comparable to that of asthma (37/1,000) and back pain (41/1,000). The monthly incidence in primary care was 1.6/1,000 [5].

The impact of CPP on quality of life has been studied by several authors. Estimates are that 15% of women with CPP report time lost from paid work and 45% report reduced work productivity; 26% reported that they had stayed in bed more than half the day (bed day) on one or more days during the previous month because of pelvic pain (the mean number of bed days was  $2.6 \pm 2.4$ ) [6]. Approximately half of those women with pelvic pain (52.7%) reported that their pain affected their activities (inability to carry out activities without taking analgesics or resting, and limitations in mobility, particularly moving and walking), and felt that their social, family, and sexual activities were affected [7].

Studies generally agree about the high prevalence of the syndrome [4, 6, 8, 9], affecting two to 16% of the popula-

tion worldwide [10], with a lifetime incidence of 33% [11]. No agreement exists, though, on the terminology to denominate the syndrome or about the associated symptoms. Thus, while some studies define CPP as lower abdominal or pelvic pain lasting at least six months, which can be either continuous or intermittent, but is not associated with the menstrual cycle or sexual activity [1-2]; other definitions include wider regions affected by the pain (abdominal wall, umbilical area, and lumbosacral region) and also contemplate the resulting limitations in activities of daily living [12-13]. Other definitions, though, exclude pain related with intestinal or urogenital infection [6,9] or consider CPP to be present if the pain has lasted for more than three months [14]. Proof of all this confusion is the use and standardization of the questionnaire NIH-CPSI [15] not only for the disease it was designed for (chronic prostatitis), but also to provide prevalence data for several other disorders causing CPP. The suitability and relevance of this questionnaire, though, have not yet been assessed [16]. Accordingly, the prevalence data, and consequently the resulting conclusions, should be interpreted with caution.

The definition of CPP in the present study, as well as including lower abdominal or pelvic pain lasting at least six months, which can be either continuous or intermittent, but is not related with the menstrual cycle or sexual intercourse, also includes a score  $\geq 6$  on the CPPQ-M (Cuestionario Dolor Pélvico Crónico – Mohedo [Chronic Pelvic Pain Questionnaire – Mohedo]) [16]. The discriminative capacity of this instrument has already been validated among persons with and without CPP [16]. The purpose of this study,

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therefore, was to determine the prevalence of CPP symptoms in women aged 18-65 years in Malaga and its province using the CPPQ-M questionnaire and, depending on the results, detect the main risk factors associated with a higher score.

## Materials and Methods

### Study type

The authors undertook a cross-sectional population-based study in 2011 in Malaga and its province.

### Participant selection

The sample size needed was calculated to be 850 persons to estimate the confidence intervals for percentages with error margins less than three percent in the situation of greatest uncertainty. The sample size was proportional to the population pyramid of Malaga in age, and proportional to the nine counties in the province of Malaga. The participants were selected by non-probabilistic sampling and by quotas assigned to interviewers. The sample for this study included supposedly healthy non-institutionalized adults, aged between 18 and 65 years ( $n = 940$  women).

### Inclusion and exclusion criteria

The inclusion criteria required the participant to be resident in Malaga or its province, aged 18-65 years, and with a minimum cognitive level sufficient to read and understand the questionnaire and then complete it.

To study the risk factors associated with higher CPPQ-M scores, and taking into account the diagnosis and/or etiological factors considered to cause CPP having Vercellini evidence levels A and B [17], the authors analyzed the most prevalent risk factors for which they had a sufficient number of cases (Table 1). Thus, persons were excluded from the analysis if, at the time of the study, they had had any one of these factors for less than six months, as this was an exclusion factor. A total of 141 women were excluded.

### Data collection

The data were collected by 154 students from Malaga university. According to their place of residence and family and/or social setting, each student was given a quota (varying in age group) of questionnaires to be completed. These quotas were assigned to represent the population pyramid of Malaga, in age and sex, and proportional to the nine counties in the province of Malaga. The students underwent a prior training period to learn about the justification and aims of the study, the inclusion criteria, and the methodology in order to guarantee the veracity of the data and their confidentiality. They also had to be available at all times to answer any doubts the participants might have about the questionnaire. The tool used was the self-administered CPPQ-M questionnaire.

This questionnaire (<http://www.salud.uma.es/cppq-mohedo/>) groups the items in two dimensions (pain and quality of life) and provides a weighted score corresponding to the sum of the affirmative answers. The maximum score is 27 points [16].

Additional information was also collected regarding personal and demographic data, education level, occupation, pregnancies and births, contraception, physical activity, and postural, sexual, and dietary habits. The participants also provided relevant information about their past and present medical conditions, including any diagnoses and the corresponding treatment. This information was used for the risk-factor association study.

Table 1. — Prevalent diagnoses included in the study.

System	Evidence A	Evidence B
Gynaecological	Endometriosis	Adhesions
	Gynaecological malignancy	Benign cysts
	Ovarian remnant syndrome	Myomas
	Pelvic inflammatory disease	Peritoneal postsurgical cysts
Urological	Interstitial cystitis or painful bladder syndrome	
Gastrointestinal	Colon carcinoma	Diverticular disease
	Constipation	
	Inflammatory bowel disease Irritable bowel disease	
Musculoskeletal	Back or coccygeal region pain	
	Postural alterations	
	Neuralgia (iliohypogastric, ilioinguinal, genitourinary or pudendal nerve)	

*Evidence A:* Good consistent evidence between the cause and the chronic pelvic pain. *Evidence B:* Limited inconsistent evidence between the cause and the chronic pelvic pain.

The level of education and the occupation were classified according to the scale proposed by the Spanish Society of Epidemiology working group on the measurement of social class in health sciences [18]. To analyze the influence of these factors on the prevalence of CPP symptoms, these factors were grouped into the following categories: low (illiterate or uncompleted primary education); medium (primary education completed, elemental or basic general education, or professional training); and high (higher education, university entrance exam, university graduates, and doctors of any discipline). The socio-economic status was classified as low, medium or high. The living environment was considered to be that of the usual place of residence, grouped by county: Antequera, Axarquía, Serranía de Ronda, Guadalteba, Valle del Guadalhorce, Costa del Sol, Malaga, Comarca Nororiental, and Sierra de las Nieves.

Physical activity was defined as specific physical activity for longer than 30 minutes at least three times a week, and a fiber-rich diet as the consumption of 20-35 grams of vegetable fiber per day (at least two pieces of fruit and three servings of vegetables and cereals).

The results obtained were transferred to a specially designed database. This enabled us to perform later verification by phone of all the data in those persons who reported symptoms of CPP and who had provided contact information.

### Ethical considerations

The voluntary completion of the questionnaire implied acceptance to participate in the study, ensuring at all times the confidentiality of the data.

### Statistical analysis

The results are shown as estimated mean differences between individuals with and without risk factors, 95% confidence interval and statistical significance for the null hypothesis that this difference is zero, adjusted by sex and age. The statistical analysis was performed with SPSS and verified with the R package, with the "boot" bootstrap libraries [19].

Table 2. — Main epidemiological characteristics of the population sample.

Age Groups	18-29	30-39	40-49	50-59	60-65	TOTAL
Weight	60.2 (± 8.8)	63.2 (± 8.8)	66.5 (± 12.5)	67.3 (±11.2)	69.0 (±13.4)	64.6 (±11.7)
Height	162.7 (± 15.9)	163.6 (± 6.8)	162.4 (± 5.7)	160.0 (±6.7)	155.3 (±22.9)	161.5 (±12.3)
BMI*	23.1 (± 3.2)	24.3 (± 4.0)	25.8 (± 4.5)	26.8 (±4.4)	27.4 (±4.4)	25.0 (±4.3)
OCCUPATION						
Student	62.0%	2.2%	0%	0%	0%	16%
Active	31.8%	71.1%	66.0%	56.6%	17.7%	49.9%
Unemployed	4.7%	13.3%	4.7%	9.4%	1.6%	6.9%
H.C**	1.6%	13.3%	29.2%	34.0%	53.2%	23.1%
Retired	0%	0%	0%	0%	27.4%	3.4%
LEVEL OF STUDIES						
No studies	0.8%	0%	3.3%	6.7%	17.9%	4.2%
Basic	7.4%	19.7%	31.3%	44.4%	53.7%	27.4%
High School	27.2%	29.3%	42.7%	24.2%	14.7%	29.3%
Graduate	64.6%	51.1%	22.7%	24.7%	13.7%	39.1%
PHYSICAL ACTIVITY						
Yes	52.3%	49.5%	45.5%	51.7%	47.4%	49.5%
No	47.7%	50.5%	54.5%	48.3%	52.6%	50.5%
MOVE WEIGHT						
Yes	16.5%	28.9%	30%	31.4%	15.4%	25%
No	83.5%	71.1%	70%	68.6%	84.6%	75%
LAXATIVES AND/OR FIBER RICH DIET						
Yes	14.2%	26.7%	19.0%	28.2%	23.7%	21.6%
No	85.8%	73.3%	81.0%	71.8%	76.3%	78.4%

\*BMI: Body Mass Index. \*\*H.C.:Household chore

Table 3. — Prevalence by age group

Sex	Age Group (Years)	Frequency and Percentage
Women	18-29	65 (25.8%)
	30-39	65 (25.8%)
	40-49	48 (19.0%)
	50-59	49 (19.4%)
	60-+	25 (9.9%)

## Results

The main epidemiological characteristics of the study population are summarized in Table 2. The prevalence of CPP symptoms in women aged 18-65 years in Malaga and its province was 26.8%. Table 3 shows the prevalence by age group. The mean score on the questionnaire was  $3.51 \pm 4.7$ . No associations were found between the CPPQ scores and age.

The present study detected a group of 158 women (23.7%) who, despite having CPP symptoms for over six months, still had no obvious diagnosis (women who had no current medical diagnosis, but had CPP symptoms and, therefore, discriminatory scores on the CPPQ-M).

After correcting the epidemiological data for age, no significant differences were found in occupation, economic status, level of studies, having or not having sexual intercourse, the use or not of contraception, the type of contraception used (hormonal, barrier or surgical), parity, type

Table 4. — Factors associated with higher CPPQ-Mohedo scores

Risk factor	Mean*	SE	95% CI	P
Physical activity	-3.02	4.27	-0.29 — -1.26	0.001
Moving and/or lifting heavy loads in ADL**	3.57	4.51		0.008
Laxatives and/or fiber-rich diet	4.71	5.07	2.50 — 1.32	0.000
Recurrent urogenital infectious disease	4.40	5.22	3.02 — 0.02	0.047
Pelvic trauma	4.77	4.55	3.59 — 0.18	0.030
Irritable bowel	5.10	5.50	4.24 — 0.18	0.032
Anal fissure	7.46	6.50	6.69 — 2.52	0.000
Uterine prolapse	13.66	2.36	15.07 — 6.47	0.000

\*Mean of the effect between persons who had the risk factor and those who did not. \*\*ADL : Activities of daily living.

of delivery (vaginal, instrumental, episiotomy or cesarian), or total number of deliveries.

After studying the risk factors associated with higher CPPQ-M scores, the crude results of the comparisons between the women who had and did not have a risk factor, as well as the differences after adjusting for age are presented in Table 4. Those women who undertook physical activity had a lower CPPQ-M score than those who did not (mean difference:  $-3.02 \pm 4.27$ ). Risk factors associated with a higher score were lifting and/or moving heavy loads during everyday activities ( $3.57 \pm 4.51$ ), consuming laxatives

and/or a fiber-rich diet ( $4.71 \pm 5.07$ ), and a history of recurrent urogenital infection (e.g., vulvovaginitis, cystitis,) ( $4.40 \pm 5.22$ ), pelvic trauma ( $4.77 \pm 4.55$ ), irritable bowel ( $5.10 \pm 5.50$ ), anal fissure ( $7.46 \pm 6.50$ ) or uterus prolapse ( $13.66 \pm 2.36$ ). The CPPQ-M scores for other conditions reported (inflammatory pelvic disease, endometriosis, hemorrhoids, constipation, bladder prolapse, benign cysts, myomas, or prior surgery) presented no significant differences.

## Discussion

To the authors' knowledge, this is the first time that a high prevalence of symptoms of this disease has been reported in Spain; 26.8% for Spanish women. This places Spain among the countries with the highest prevalence according to a recent review showing that the worldwide prevalence of CPP ranges from two to 24% [20].

CPP affects 14.7% of American women aged 18-50 years [6], 21.5% of Australian women [21], 24%-25.5% of women in New Zealand [4,7,9], and 15.1% of women of reproductive age in Brazil [22]. The high figure found in this study may be due to the wide age range contemplated.

The finding that 23.7% of the participants had discriminatory scores on the CPPQ-M although they had no actual diagnosis, may be due to the diagnostic difficulty of the syndrome, not seeking medical help, or the association in women with pain, which may lead to an underestimation of the diagnosis by the primary care physician [22-23].

Although an association has recently been found between CPP and current sexual intercourse and abdominal surgery (cesarian) [22], the epidemiological characteristics of the present sample agree with those of other studies concerning the lack of association between CPP and level of studies or education, socioeconomic status, parity, use of oral contraceptives, a low body mass index, living in the mountains, no sexual intercourse, and cesarian delivery or episiotomy [6, 24-26].

The current results coincide with those of Bartoletti *et al.* (although this study only assessed CPP in men) in finding significant differences ( $p < 0.001$  in his study and  $p = 0.000$  in the present) between CPP and mild alterations in eating habits, e.g., need for a fiber-rich diet and/or laxatives [8]. Since the study design did not contemplate verification of symptoms of constipation using the Rome III criteria, the present can only note that just 12.4% of those who had these eating habits reported suffering from constipation; and consequently reflect on the possible role of a fiber-rich diet in the development of CPP symptoms.

The present results also coincide with those of Vercellini *et al.*, detecting a lower risk for CPP in those women who undertook physical exercise [27]. The present authors are unaware of the reason for this, although the presence or otherwise of pain may affect the practice of physical exercise.

Although the authors recorded information about postural habits (hours spent standing, seated, and driving), lifting

heavy loads during activities of daily living, the type of delivery (natural vaginal, episiotomy, instrumental), and the type of contraception (barrier, IUD, surgery), they have found no relevant data with which to make comparisons and draw conclusions.

Although Vercellini *et al.* consider recurrent urologic infections with evidence grade C (causal relationship to CPP based on expert opinion) [17], the significance found in the current study and that in the study of Oliveira *et al.* [22] suggests the need to examine the etiologic role of these infectious processes, in an attempt to determine whether they occur before the CPP and thus contribute to its development or whether they are in fact the consequence of CPP.

Concerning other risk factors associated with CPP, the current results are in agreement with those of others who also found a link with intestinal, urinary, gynecological, and myofascial disorders [28-29], but with the associated diagnostic difficulty.

Specifically, concerning intestinal disorders, the present results also coincide with cross-sectional studies showing that approximately one-third of women with chronic pelvic pain have irritable bowel syndrome (IBS) [23,30]. In the present study, 42.1% ( $n = 16$ ) of those who had a high CPPQ score reported having suffered from IBS in the past. As treatment of this disorder involves dietary manipulation and antispasmodic agents with fiber supplementation to relieve symptoms, this may partly explain the significance found in the present study with a fiber-rich diet.

Every year 235,000 new cases of anal fissure are reported in the US and about 40% of them persist for months and even years [31]. Lateral internal sphincterotomy remains the gold standard for definitive management of anal fissure [32]. In the present study, only seven percent of women had had surgery; it is therefore possible that the others had had an increased anal tone and chronic tension of the pelvic floor muscles for many years, something often associated with anal fissure [31]. In these patients, often with tenderness on palpation of the pubo-rectalis muscle, a paradoxical contraction of the pelvic floor muscles on attempted defecation has often been documented and its therapeutic reversal would correlate with clinical benefit [33-34].

Concerning gynecological disorders, endometriosis is the most common gynecological disorder causing CPP [35]. Thus, endometriosis plays a significant role due to its frequency and its effects on the quality of women's lives. The lack of significance in the present study was probably due to the low number of women with endometriosis ( $n = 5$ ), which explains why this did not reach statistical significance despite the high score on the questionnaire.

The exact prevalence of uterine prolapse is unknown. Forty percent of participants in the women's health initiative trial in the United States had some degree of prolapse [36]. Delancey's three levels of support are now accepted worldwide [37]. Uterine prolapse causes myofascial alterations; specifically, the cardinal-uterosacral ligament com-

plex breaks or is attenuated. Many symptoms have been attributed to prolapse, including perineal pain. One study showed that the number and intensity of symptoms increased with an increasing stage of prolapse [38]. In the present study, the women had high CPPQ scores but they received no gynecological examination to assess the level of prolapse; accordingly, the present authors are unable to determine any correlation with this. The association between prolapse and connective tissue metabolism is well established [39-40]. However, the causality of this association is unclear [41]. The results of these latter studies suggest that pelvic organ prolapse is an acquired disorder of the extracellular matrix and that therapies targeting matrix proteases may be successful for preventing or ameliorating pelvic organ prolapse in women [40].

If we consider that the myofascial component is an important protagonist in this dysfunction, mention should be made of the interesting studies undertaken relating to myofascial therapy. Manual myofascial therapy involves an elongation of tendons, aponeuroses, and other dense fibrous connective tissues. While little is known about the continued development of tissue hydration during the minutes and hours after tissue elongation, findings suggest that during this recovery period a gradual rehydration of the tissue can be expected, which tends to be associated with a gradual regaining of the initial tissue stiffness [42]. Future in vivo studies are needed to determine whether and under what circumstances the in vitro changes in tissue hydration reported in that study also occur in living bodies. Such studies could have implications for a better understanding of the effects of various stretching routines as well as of myofascial manipulation on viscoelastic tissue properties.

The present study has identified several factors as independent predictors for symptoms of CPP. The authors have not, however, reached final conclusions about the causal relationship between these factors and CPP. A thorough investigation and other different types of studies are necessary to corroborate these results.

The CPPQ-M questionnaire is not a diagnostic tool for CPP. It is, however, useful to detect patients with CPP in primary care and refer them sooner for specialized care and appropriate diagnosis and treatment.

#### Study limitations

The questionnaire was self administered. This has the advantages of convenience and low cost, but it also has the disadvantage of not being able to determine the actual reaction to each question or detect any doubts or misunderstandings, although the participants were able to consult about any specific doubt and receive clarification about any particular question. Additionally, as the authors did not have direct access to the official medical history (and could not therefore confirm the information provided by the patients), they may have underestimated the true incidence, as it is not normal to state one has this sort of disease when

it is not the case. Nor was a physical examination performed or objective diagnostic tests done to determine agreement or otherwise between the clinical findings and the score obtained on the CPPQ-M.

#### Conclusion

The prevalence of CPP symptoms is high (26.8%) in Spanish women. This is related with several risk factors (moving and/or lifting heavy loads, laxatives, and/or fiber-rich diet, recurrent urogenital infectious disease, pelvic trauma, irritable bowel disease, anal fissure, and uterine prolapse).

The lack of an international agreement about CPP and its definition limits an epidemiological study as there is no clear, well-defined objective in order to be able to compare the results. Thus, it is necessary to join forces to establish an agreement and, consequently, enable studies to be reproduced in other populations. Only after further studies will it be possible to determine the true situation with regards to CPP, and then design multidisciplinary preventive, diagnostic, and therapeutic strategies to deal with such an incapacitating syndrome.

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