

# Quality of life and associated factors in Brazilian women with chronic pelvic pain

Rosa Azevedo Da Luz<sup>1</sup>  
José Miguel de Deus<sup>1,2</sup>  
Délío Marques Conde<sup>2</sup>

<sup>1</sup>Teaching Hospital, Federal University of Goiás, Goiânia, Goiás, Brazil;

<sup>2</sup>Department of Obstetrics and Gynecology, Federal University of Goiás, Goiânia, Goiás, Brazil

**Background:** Chronic pelvic pain (CPP) is a common and debilitating clinical condition in women.

**Objectives:** The aim of this study was to compare the quality of life (QoL) of women with and without CPP and to investigate factors associated with the QoL of women with CPP.

**Patients and methods:** A cross-sectional study was conducted with 100 women with CPP and 100 women without CPP. QoL was evaluated using the abbreviated version of the World Health Organization QoL instrument (WHOQOL-BREF). Depression and anxiety were evaluated using the Hospital Anxiety and Depression Scale, and sexual function was evaluated using the Female Sexual Function Index. Generalized linear models were used to analyze the data, permitting comparison of QoL scores and identification of the factors affecting QoL.

**Results:** Mean age ( $\pm$  SD) was  $37.8 \pm 8.0$  and  $37.2 \pm 9.6$  years for women with and without CPP, respectively ( $P=0.648$ ). Following adjustment, women with CPP had significantly lower QoL scores in the physical health ( $P<0.001$ ) and social relationships' ( $P=0.025$ ) domains. Anxiety, depression, sexual dysfunction, hypertension, diabetes mellitus, pain intensity, lower family income, and not having a partner were factors negatively associated with QoL, while being postmenopausal, being employed, and having a child were positively associated with QoL in women with CPP.

**Conclusion:** Women with CPP had poorer QoL than those without CPP. Factors affecting the QoL of women with CPP were identified, some for the first time in this population of women. Interventions targeting these factors may prove effective in minimizing the negative repercussion of CPP on QoL.

**Keywords:** depression, anxiety, pain intensity, quality of life, hypertension, sexual dysfunction

## Introduction

Chronic pelvic pain (CPP) in women is a common, debilitating clinical condition. A systematic review found a prevalence of CPP that ranged from 5.7% to 26.6%.<sup>1-3</sup> The number of studies on CPP was also found to be decreasing, from 18 studies published until 2004 to seven studies between 2005 and 2012. Most countries published no studies at all on the subject.<sup>1</sup>

The most common factors associated with CPP in women are endometriosis, irritable bowel syndrome,<sup>4,5</sup> genitourinary symptoms, and pelvic adhesions.<sup>4,6</sup> In addition to physical predictors, psychological factors such as stress, anxiety, and depression are often associated with CPP.<sup>5-8</sup> Since these factors hamper the etiological diagnosis and

Correspondence: Délío Marques Conde  
Departamento de Ginecologia e  
Obstetrícia, Faculdade de Medicina,  
Universidade Federal de Goiás, R 235,  
s/n, Setor Leste Universitário, Goiânia,  
74605-050 Goiás, Brazil  
Tel +55 62 3209 6151  
Email delioconde@gmail.com

clinical management, this could partially explain why women with CPP tend to report a long history of pain.<sup>7,8</sup>

Prior studies have shown that sexual function,<sup>9–11</sup> work,<sup>12</sup> mood,<sup>7,8,13</sup> sleep, and mobility can be negatively affected in women with CPP.<sup>5,13</sup> These findings suggest a negative effect on quality of life (QoL). The World Health Organization (WHO) defines QoL as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.”<sup>14</sup> There are few studies on the QoL of women with CPP. Some of these studies focused exclusively on women with endometriosis,<sup>15,16</sup> some included women with CPP of other causes or of unknown etiology,<sup>7,8,11,17</sup> and others included women without CPP as controls.<sup>5,8,11</sup> Comparison with women without CPP showed lower QoL scores in women with CPP in the physical health and psychological health,<sup>7,11</sup> bodily pain, and social functioning domains.<sup>8</sup> Different questionnaires found different domains to be affected. However, the domains differ as a function of the QoL instrument used.

Negative associations have been found between the QoL of women with CPP and depression,<sup>7,8</sup> anxiety, and the intensity of pain,<sup>7,8,16,17</sup> while positive associations have been found with the practice of physical activity.<sup>15</sup> Although findings differ, they suggest directions for new studies, particularly with respect to factors associated with QoL. Moreover, these factors are of interest in clinical practice as possible intervention targets to minimize the negative repercussion of CPP on QoL.

The WHO’s definition highlights the importance of considering the individual’s perception of QoL within their sociocultural context. In this respect and taking the lack of data on the subject into account, the present study was designed to compare the QoL of women with and without CPP and to investigate factors associated with QoL in women with CPP.

## Patients and methods

### Sample size

Sample size was calculated using the score SD value of 14.4 obtained for women with CPP in the psychological health domain of the abbreviated version of the WHO’s QoL instrument (WHOQOL-BREF).<sup>17,18</sup> Considering an acceptable difference in the mean psychological health domain score of 6.0 in women with and without CPP (–42% of the SD), for a type I error of 5% and a type II error of 20%, sample size was calculated at a minimum of 91 women with CPP and 91 controls.<sup>19</sup>

## Participants

This cross-sectional study was conducted between October 2014 and February 2016 at the Department of Obstetrics and Gynecology, Teaching Hospital, Federal University of Goiás, Goiânia, Goiás, Brazil. The Institutional Review Board of the Teaching Hospital of the Federal University of Goiás approved the study protocol, and all the participating women signed an informed consent form.

Women aged  $\geq 18$  years, with and without CPP, who were being followed up as outpatients and who reported being in heterosexual relationships, were invited to participate. For the CPP group, women reporting at least 6 months of lower abdominal pain not exclusively cyclical or coitus related were included. However, bearing in mind the study objectives, information on the cause of CPP was not collected. The women with CPP were included in the study irrespective of whether or not they were undergoing any form of treatment for the pain. The control group consisted of women without CPP. These controls were being followed up for benign gynecological conditions such as ovarian cysts, endometrial polyps, and fibroids. Women with and without CPP were excluded if they had been pregnant in the preceding year, were currently pregnant, or had a history of cancer.

Following a routine consultation, 207 consecutive women were invited to participate in the study: 103 women with CPP and 104 women without CPP. Three women with CPP and four women without CPP refused to participate, alleging lack of time, leaving 100 women with CPP and 100 women without CPP in the study.

Sociodemographic, clinical, and lifestyle characteristics, including age, ethnicity (White/non-White), body mass index (BMI; kg/m<sup>2</sup>), marital status (partner/no partner), monthly family income (Brazilian real, R\$), education (years of schooling), employment status (employed, in paid work/unemployed, retired, and homemaker), physical activity in the preceding month (yes/no), smoker (yes/no), alcohol consumption in the previous 3 months (yes/no), parity (0/ $\geq 1$ ), and menopausal status (premenopausal/postmenopausal), were collected by interview. Hypertension and diabetes mellitus were self-reported (yes/no). Current smokers and those who had stopped smoking less than a year previously were defined as smokers, while never smokers and those who had stopped smoking more than a year previously were considered nonsmokers. Menopausal status was classified as postmenopausal following at least 12 months of amenorrhea.

The duration and intensity of CPP were investigated in the CPP group. A 10 cm visual analog scale (VAS) was used to grade the intensity of pain. Participants described pain

intensity on a scale of 0–10, with 0 representing the absence of pain and 10 representing the worst pain imaginable.

## Self-report questionnaires

### QoL

The generic instrument WHOQOL-BREF,<sup>18</sup> already translated and validated for use in Brazilian Portuguese,<sup>20</sup> was used to assess QoL. This multidimensional questionnaire consists of 26 items, with 24 items related to the following four domains: physical health, psychological health, social relationships, and environment. Two additional questions evaluate overall QoL and general health. For the purposes of this study, the four domains were used. Higher scores are indicative of better QoL.<sup>18</sup>

### Sexual function

Sexual function was evaluated using the Female Sexual Function Index (FSFI),<sup>21</sup> a multidimensional self-report instrument that assesses female sexual function in the preceding 4 weeks and consists of 19 items and the following six domains: desire, arousal, lubrication, orgasm, satisfaction, and pain.<sup>21</sup> The FSFI has been translated and validated for use in Brazilian Portuguese.<sup>22</sup> Scores for questions range from 0 or 1 to 5, with the overall score being obtained from the sum of the scores of each domain and ranging from 2 to 36. Higher scores indicate better sexual function.<sup>21</sup> Sexual dysfunction was defined as an overall FSFI score of  $\leq 26.55$ .<sup>23</sup>

### Anxiety and depression

The Hospital Anxiety and Depression Scale (HADS),<sup>24</sup> translated and validated for use in Brazilian Portuguese,<sup>25</sup> was used to evaluate anxiety and depression. The HADS consists of 14 items: seven items related to anxiety (HAD-A) and seven items to depression (HAD-D). Each item is awarded a score of 0–3, with the sum of the scores obtained for each subscale ranging from 0 to 21.<sup>24</sup> A cutoff point of  $\geq 8$  was established, both for the anxiety and depression domains, as being indicative of anxiety and depression disorders, respectively.<sup>25</sup>

## Statistical analysis

The variable CPP (with/without) was the principal independent variable, with QoL as the dependent variable. The potential confounding variables were age, ethnicity, marital status, monthly family income, education, employment status, physical activity, smoking, alcohol consumption, parity, menopausal status, BMI, hypertension, diabetes mellitus, anxiety, depression, and sexual dysfunction. Results are presented as mean  $\pm$  SD or as absolute frequencies and percentage,

according to the type of variable. The unpaired two-sided Student's *t*-test, the chi-square test, and the Mann–Whitney test were used to compare sociodemographic, clinical, and lifestyle characteristics between the groups. The generalized linear model (GLM) was used to compare QoL scores, with adjustment for potential confounding variables.<sup>26</sup> GLM with backward selection criteria allowed identification of the factors affecting the QoL of women with CPP, with calculation of the estimated coefficient and standard error. The SPSS statistical software program, Version 20.0, was used for data analysis. Significance was defined at 5% ( $P < 0.05$ ).

## Results

The mean age ( $\pm$  SD) of the women with CPP was  $37.8 \pm 8.0$  compared to  $37.2 \pm 9.6$  for the controls ( $P = 0.648$ ). The mean BMI was  $25.6 \pm 4.8$  kg/m<sup>2</sup> for the CPP group and  $26.7 \pm 6.0$  kg/m<sup>2</sup> for the controls ( $P = 0.245$ ) (Table 1).

Table 2 lists lifestyle and clinical characteristics. The prevalence of anxiety was 66.0% for the CPP group and 49.0% for the controls ( $P = 0.022$ ), with the prevalence of depression being 63.0% and 38.0%, respectively ( $P = 0.001$ ).

**Table 1** The sociodemographic characteristics and menopausal status of women with and without CPP

Characteristics	With CPP (n=100)	Without CPP (n=100)	P-value
Age (years) <sup>a</sup>	37.8 $\pm$ 8.0	37.2 $\pm$ 9.6	0.648 <sup>b</sup>
Ethnicity <sup>c</sup>			
White	33.0	27.0	0.440 <sup>d</sup>
Non-White	67.0	73.0	
Marital status <sup>c</sup>			
With partner	67.0	58.0	0.243 <sup>d</sup>
Without partner	33.0	42.0	
Body mass index (kg/m <sup>2</sup> ) <sup>a</sup>	25.6 $\pm$ 4.8	26.7 $\pm$ 6.0	0.245 <sup>e</sup>
Parity <sup>c</sup>			
0	14.0	25.0	0.074 <sup>d</sup>
$\geq 1$	86.0	75.0	
Monthly family income (R\$) <sup>a</sup>	1,931.3 $\pm$ 1,237.6	1,867.4 $\pm$ 1,063.3	0.958 <sup>e</sup>
Employment status <sup>c</sup>			
Employed/performing paid work	44.0	54.0	0.203 <sup>d</sup>
Unemployed/retired/homemaker	56.0	46.0	
Schooling (years) <sup>c</sup>			
<11	52.0	44.0	0.322 <sup>d</sup>
$\geq 11$	48.0	56.0	
Menopausal status <sup>c</sup>			
Premenopausal	79.0	79.0	1.000 <sup>d</sup>
Postmenopausal	21.0	21.0	

**Notes:** <sup>a</sup>Values expressed as mean  $\pm$  SD. <sup>b</sup>Student's *t*-test. <sup>c</sup>Values expressed as percentage. <sup>d</sup>Chi-square test. <sup>e</sup>Mann–Whitney test for independent samples.

**Abbreviation:** CPP, chronic pelvic pain.

**Table 2** Lifestyle and clinical characteristics of women with and without CPP

Characteristics <sup>a</sup>	With CPP (n=100)	Without CPP (n=100)	P-value <sup>b</sup>
Physical activity			
Yes	27.0	19.0	0.240
No	73.0	81.0	
Smoker			
Yes	16.0	6.0	0.042
No	84.0	94.0	
Alcohol consumption			
Yes	36.0	42.0	0.469
No	64.0	58.0	
Hypertension			
Yes	17.0	16.0	1.000
No	83.0	84.0	
Diabetes mellitus			
Yes	7.0	2.0	0.170
No	93.0	98.0	
Anxiety <sup>c</sup>			
Yes	66.0	49.0	0.022
No	44.0	51.0	
Depression <sup>c</sup>			
Yes	63.0	38.0	0.001
No	37.0	62.0	
Sexual dysfunction <sup>d</sup>			
Yes	81.0	58.0	0.001
No	19.0	42.0	

**Notes:** <sup>a</sup>Values expressed as percentage. <sup>b</sup>Chi-square test. <sup>c</sup>Anxiety and depression were evaluated using the HADS. <sup>d</sup>Sexual function was evaluated using the FSFI.

**Abbreviations:** CPP, chronic pelvic pain; FSFI, Female Sexual Function Index; HADS, Hospital Anxiety and Depression Scale.

**Table 3** Comparison of quality of life scores between women with and without CPP

WHOQOL-BREF domains	Mean score ± SD		Unadjusted P-value <sup>a</sup>	Adjusted P-value <sup>b</sup>
	With CPP	Without CPP		
Physical health	49.1±18.6	63.7±19.1	<0.001	<0.001
Psychological health	56.2±16.6	64.4±19.6	0.001	0.913
Social relationships	58.9±20.0	69.4±21.2	<0.001	0.025
Environment	51.8±15.6	51.4±17.7	0.884	0.071

**Notes:** <sup>a</sup>Student's t-test. <sup>b</sup>Adjusted for group, age, ethnicity, marital status, monthly family income, education, employment status, physical activity, smoking, alcohol consumption, parity, menopausal status, body mass index, hypertension, diabetes mellitus, anxiety, depression, and sexual dysfunction, using the generalized linear model.

**Abbreviations:** CPP, chronic pelvic pain; WHOQOL-BREF, World Health Organization QoL instrument.

The prevalence of sexual dysfunction was 81.0% for the CPP group and 58.0% for the controls ( $P=0.001$ ).

In the CPP group, the mean duration of pain was 7.0±6.0 years and the intensity of pain was 7.8±2.1.

The WHOQOL-BREF scores are shown in Table 3. In the unadjusted analysis, women with CPP had significantly lower mean scores in the physical health ( $P<0.001$ ) and

psychological health ( $P=0.001$ ) and social relationships' ( $P<0.001$ ) domains. Following adjustment for potential confounding variables, a statistically significant difference remained in the physical health ( $P<0.001$ ) and social relationships' ( $P=0.025$ ) domains.

Anxiety was negatively associated with the physical health ( $P<0.001$ ) and psychological health ( $P=0.011$ ) and environment ( $P=0.008$ ) domains. Being employed/in paid work was positively associated with the physical ( $P=0.015$ ) and psychological health ( $P=0.007$ ) domains. Sexual dysfunction negatively affected the physical ( $P=0.027$ ) and social relationships' ( $P=0.002$ ) domains (Table 4).

**Table 4** Factors associated with the quality of life of women with CPP

WHOQOL-BREF domains/factors	Estimated coefficient	Standard error of estimated coefficient	P-value <sup>c</sup>
Physical health <sup>a</sup>			
Anxiety (yes)	-0.248	0.063	<0.001
Pain intensity	-0.043	0.013	<0.002
Employment status (employed/in paid work)	0.151	0.062	0.015
Hypertension (yes)	-0.210	0.092	0.022
Sexual dysfunction (yes)	-0.158	0.072	0.027
Constant	4.467	0.129	<0.001
Psychological health <sup>b</sup>			
Parity (≥1)	13.330	3.384	<0.001
Depression (yes)	-10.985	3.660	0.003
Employment status (employed/in paid work)	7.824	2.921	0.007
Menopausal status (postmenopausal)	9.986	3.782	0.008
Anxiety (yes)	-9.659	3.805	0.011
Constant	52.664	4.876	<0.001
Social relationships <sup>b</sup>			
Diabetes mellitus (yes)	-21.652	5.862	<0.001
Sexual dysfunction (yes)	-19.624	6.347	0.002
Parity (≥1)	11.154	5.189	0.032
Constant	66.940	7.144	<0.001
Environment <sup>a</sup>			
Monthly family income (≤ R\$ 1,600)	-0.200	0.050	<0.001
Anxiety (yes)	-0.156	0.059	0.008
Pain intensity	-0.027	0.011	0.016
Depression (yes)	-0.125	0.059	0.035
Marital status (no partner)	-0.111	0.054	0.040
Constant	4.464	0.100	<0.001

**Notes:** <sup>a</sup>Normal distribution. <sup>b</sup>Gamma distribution. <sup>c</sup>Adjusted for age, ethnicity, marital status, monthly family income, education, employment status, physical activity, smoking, alcohol consumption, parity, menopausal status, body mass index, hypertension, diabetes mellitus, anxiety, depression, sexual dysfunction, intensity of pain, and duration of pain, using the generalized linear model.

**Abbreviations:** CPP, chronic pelvic pain; WHOQOL-BREF, World Health Organization QoL instrument.

## Discussion

This study aimed to compare the QoL of women with and without CPP and to investigate factors associated with the QoL of women with CPP. Few studies have evaluated this question and still fewer have studied the factors associated with QoL. Some studies evaluated only women with endometriosis,<sup>15,16</sup> which may restrict understanding of the QoL of women with CPP. Previous studies reported that 50.1%, 61%, and 47.6% of women with CPP were unaware of its cause.<sup>4,12,13</sup>

Following adjustment for potential confounding variables, women with CPP in the present study had significantly lower QoL scores in the physical health and social relationships' domains. In agreement with these findings, other studies have reported an effect on the social relationships' domain.<sup>7,8</sup> This suggests a detrimental effect of CPP on personal relationships and social support. A previous study showed progressive social isolation in women with endometriosis who developed pelvic pain,<sup>27</sup> hampering their relationships with partners, family, and friends. In agreement with previous findings, CPP also hampered activities of daily living, as shown by the results for the physical health domain.<sup>4,5,28</sup> Poor scores for the physical health domain also suggest the presence of discomfort, fatigue, impaired mobility and work capacity, and dependency on treatment. Similar findings have been reported, with a significant QoL reduction in the physical health domain for women with CPP;<sup>7,11,15,29</sup> however, not all studies used a control group.<sup>15,29</sup> Loss of work time, reduced work capacity, and a greater likelihood of sleep disorders and fatigue have also been reported,<sup>4,5,12,13</sup> as well as impaired mobility in women with CPP.<sup>4,5</sup> Those data confirm the present findings, since aspects related to work, sleep, fatigue, and mobility, are dealt with the WHOQOL-BREF and were found to be significantly impaired in women with CPP. Similarly, other authors also failed to find any significant differences in the environment domain or in aspects related to emotional health and mental health.<sup>7,8,11</sup> The most affected QoL domains differed somewhat between those studies and the present one. These differences may result from the use of different instruments, means of data collection (mail, telephone, and interview), or cultural differences, since self-perception is relevant when evaluating QoL. In this study, the significant difference in QoL scores between women with and without CPP persisted in two domains following adjustment, indicating a need to consider the confounding effect of certain variables such as sexual function, employment status, pain intensity, anxiety, and depression when evaluating QoL in women with CPP.

In this present cohort of women with CPP, mood disorders (anxiety and depression) were negatively associated with QoL. Anxiety affected the physical health and psychological health and environment domains, while depression affected the psychological health and environment domains. The prevalence rates of anxiety and depression were 66% and 63%, respectively, in women with CPP, significantly higher than the rates found in the controls. Romão et al<sup>7</sup> applied the HADS to a cohort of 52 women with CPP and reported prevalence rates of anxiety and depression of 73% and 40%, respectively. Similarly, previous studies have reported the negative effect of mood disorders in different QoL domains in women with CPP.<sup>7,8</sup> Mood disorders may also be associated with functional impairment, including difficulties with household activities, sleep problems, loss of work time, and reluctance to attend social events.<sup>28</sup> Studies argue that the cause of CPP plays no role in the occurrence of anxiety and depression.<sup>17,30</sup> This suggests that the chronic pain itself, and not its cause, is the central factor associated with psychological symptoms. Indeed, the long mean duration of the pain, ~7.0 years, together with its intensity (mean 7.8) could have contributed to the high prevalence of depression and anxiety in this cohort. There is an ongoing debate regarding whether mood disorders are the cause or the consequence of CPP. Most probably, the relationship between anxiety, depression, and CPP is bidirectional. However, there is no definitive answer to that question. Irrespective of the theoretical model that explains the association between mood disorders and CPP, the findings highlight the need to evaluate and treat these disorders in women with CPP.

In the present cohort, the intensity of pain was negatively associated with QoL in the physical health and environment domains. Although some authors failed to identify this association,<sup>15</sup> the majority of studies reported a negative association between pain intensity and the QoL of women with CPP.<sup>8,16,17,29,31</sup> Considering the aspects evaluated in the physical health and environment domains, our data show that more intense pelvic pain significantly limited a woman's activities of daily living, mobility, capacity to work, and leisure. In this respect, previous studies have shown that a progressive reduction in pain in women with endometriosis and CPP can contribute toward improving QoL and sexual function,<sup>32-34</sup> reflecting the interrelationship between pelvic pain, QoL, and sexual function.

Sexual dysfunction is another factor that can negatively affect QoL.<sup>21</sup> According to the FSFI score, the prevalence of sexual dysfunction was found to be significantly greater in the women with CPP (81%) compared to the controls (58%).



Studies conducted in different countries have reported a higher prevalence of sexual dysfunction in women with CPP compared to those without it.<sup>9-11</sup> In Brazil, the prevalence has been reported as 49% compared to 43% in the USA.<sup>35,36</sup> Using the FSFI, Verit et al<sup>9</sup> reported a prevalence of sexual dysfunction of 67.8% and 32.2% in women with and without CPP, respectively. Other authors have reported better sexual function in women without CPP compared to those with CPP irrespective of the cause of the pain.<sup>11</sup> In the present study, sexual dysfunction was found to negatively affect the physical health and social relationships' domains. The social relationships' domain of the WHOQOL-BREF contains a question on satisfaction with sexual life. Other authors have noted the negative effect of sexual dysfunction on the QoL of patients with different chronic diseases.<sup>37-39</sup> These findings, together with ours, suggest a need to investigate sexual function in patients with chronic conditions such as CPP.

In the present study, hypertension and diabetes mellitus were negatively associated with QoL in women with CPP in the physical health and social relationships' domains, respectively. Studies have described that hypertension-related (angina pectoris, myocardial infarction, stroke, and hypertensive nephropathy) and diabetes-related (neuropathy, nephropathy, retinopathy, cardiomyopathy, coronary artery disease, peripheral vascular disease, and stroke) complications were associated with lower QoL scores.<sup>40,41</sup> These complications may impose restrictions, consequently exerting a negative effect on QoL. Nevertheless, the presence of complications was not investigated. Furthermore, a negative association has been described between awareness of chronic diseases (hypertension and diabetes) and QoL.<sup>42</sup> The participants in this study were aware that they had hypertension and diabetes, which could have contributed toward decreasing QoL.

Menopause was positively associated with QoL in the psychological health domain. This finding could be partially explained by the absence of hormonal fluctuations and the postmenopausal woman's emotional maturity, leading her to have more positive feelings, greater self-esteem, and greater acceptance of her physical appearance. Comparison of this finding with previous studies is difficult, since investigators predominantly evaluated premenopausal women.<sup>4,5,10,12,29</sup> However, CPP is common in women of reproductive and nonreproductive age.<sup>13</sup> Considering the increase in life expectancy, menopausal status will necessarily have to be taken into consideration in future studies of women with CPP. Other sociodemographic factors affect QoL. Women with CPP who are employed (physical health and psychological health domains) and who had children (psychological

health and social relationships' domains) have better QoL. Employed patients with different chronic diseases have been shown to have better QoL, also with respect to the physical health and psychological health and environment domains of the WHOQOL-BREF questionnaire.<sup>43-45</sup> Women with CPP who are active professionally had higher QoL scores, possibly due to their greater capacity to perform activities of daily living and their better self-esteem and feelings of usefulness compared to unemployed women. Regarding parity, women with children may gain a sense of fulfillment and emotional stability from motherhood and may be more involved in social events such as parties and school activities, improving their perception of their QoL.

Conversely, lower income and not having a partner negatively affected the environment domain. Considering different chronic diseases, some studies have shown better QoL in patients with multiple sclerosis and coronary artery disease who have a partner and in patients with higher incomes.<sup>43-46</sup> Considering the aspects evaluated in the environment domain, our data suggest that both the absence of a partner and having a lower income contribute to a perception of insecurity, social vulnerability, less participation in leisure activities, and dissatisfaction with housing, health care services, and transportation. Married women are believed to receive greater support from their family compared to single women, and this represents an important strategy for coping with illness, resulting in better QoL.<sup>46</sup> Higher income levels provide greater access to information, better health care services, and transportation, which may also contribute toward improving QoL.<sup>46</sup> The extreme lack of data in the literature on the relationship between these factors and the QoL of women with CPP hampers comparison with other studies. Nevertheless, we believe that our findings are coherent and expect future studies to confirm them in other cohorts of women with CPP.

Certain limitations need to be taken into consideration when interpreting these data. The cross-sectional design does not permit relationships of causality to be established. The etiology of CPP was not identified; however, evidence suggests that QoL does not depend on the etiology of the pain.<sup>11,17</sup> Furthermore, in a significant proportion of women, the cause of the pain will remain undiagnosed,<sup>4,12,13</sup> reflecting the reality of clinical practice. For a diagnosis of sexual dysfunction to be reached, some authors believe that the condition has to cause significant personal distress to the woman.<sup>32-34</sup> However, personal distress was not investigated in the participants of the present study. Caution is advised when attempting to generalize these findings. This study was conducted in a reference center, and the participants may not

be representative of the population of women with CPP. The mean intensity of pain recorded was 7.8; however, previous studies have reported the mean values of 2.74,<sup>31</sup> 5.0,<sup>16</sup> 5.5,<sup>29</sup> 5.72,<sup>9</sup> and 5.9,<sup>17</sup> values that are considerably lower than those found in the present study.

The strengths of our study lie in the control group, which permitted the comparison of QoL between women from the same institution. The use of various instruments validated and widely used in health research (WHOQOL-BREF, HADS, and FSFI) merits emphasis. Another strongpoint was the analysis adjusted for multiple confounding variables in the comparison of QoL scores and in the investigation of factors associated with QoL in women with CPP. An association was identified between various clinical and sociodemographic factors and the QoL of women with CPP. To the best of our knowledge, this is the first study to identify an association between parity, hypertension, diabetes mellitus, employment status, menopausal status, marital status, family income, sexual dysfunction, and the QoL of women with CPP.

## Conclusion

The QoL of women with CPP was poorer compared to those without CPP. Various factors affecting the QoL of women with CPP were identified that had not previously been described in this population. Therefore, this study adds information to the evidence already available on the QoL of women with CPP, highlighting pathways to be followed by health care professionals and policy makers. Future studies should investigate further into the factors identified here in order to improve the management and QoL of women with CPP.

## Author contributions

All authors contributed toward data analysis, drafting and revising the paper, and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

## References

- Ahangari A. Prevalence of chronic pelvic pain among women: an updated review. *Pain Physician*. 2014;17(2):E141–E147.
- Marszalek M, Wehrberger C, Temml C, Ponholzer A, Berger I, Madersbacher S. Chronic pelvic pain and lower urinary tract symptoms in both sexes: analysis of 2749 participants of an urban health screening project. *Eur Urol*. 2009;55(2):499–507.
- Muhammad YY, Nossier SA, El-Dawaiaty AA. Prevalence and characteristics of chronic pelvic pain among women in Alexandria, Egypt. *J Egypt Public Health Assoc*. 2011;86(1–2):33–38.
- Zondervan KT, Yudkin PL, Vessey MP, et al. The community prevalence of chronic pelvic pain in women and associated illness behaviour. *Br J Gen Pract*. 2001;51(468):541–547.
- Grace V, Zondervan K. Chronic pelvic pain in women in New Zealand: comparative well-being, comorbidity, and impact on work and other activities. *Health Care Women Int*. 2006;27(7):585–599.
- Coelho LS, Brito LM, Chein MB, et al. Prevalence and conditions associated with chronic pelvic pain in women from São Luís, Brazil. *Braz J Med Biol Res*. 2014;47(9):818–825.
- Romão AP, Gorayeb R, Romão GS, et al. High levels of anxiety and depression have a negative effect on quality of life of women with chronic pelvic pain. *Int J Clin Pract*. 2009;63(5):707–711.
- Barcelos PR, Conde DM, Deus JM, Martinez EZ. [Quality of life of women with chronic pelvic pain: a cross-sectional analytical study]. *Rev Bras Ginecol Obstet*. 2010;32(5):247–253.
- Verit FF, Verit A, Yeni E. The prevalence of sexual dysfunction and associated risk factors in women with chronic pelvic pain: a cross-sectional study. *Arch Gynecol Obstet*. 2006;274(5):297–302.
- Pitts MK, Ferris JA, Smith AM, Shelley JM, Richters J. Prevalence and correlates of three types of pelvic pain in a nationally representative sample of Australian women. *Med J Aust*. 2008;189(3):138–143.
- Tripoli TM, Sato H, Sartori MG, de Araújo FF, Girão MJ, Schor E. Evaluation of quality of life and sexual satisfaction in women suffering from chronic pelvic pain with or without endometriosis. *J Sex Med*. 2011;8(2):497–503.
- Mathias SD, Kuppermann M, Liberman RF, Lipschut RC, Steege JF. Chronic pelvic pain: prevalence, health-related quality of life, and economic correlates. *Obstet Gynecol*. 1996;87(3):321–327.
- Ayorinde AA, Bhattacharya S, Druce KL, Jones GT, Macfarlane GJ. Chronic pelvic pain in women of reproductive and post-reproductive age: a population-based study. *Eur J Pain*. 2017;21(3):445–455.
- Study protocol for the World Health Organization project to develop a quality of life assessment instrument (WHOQOL). *Qual Life Res*. 1993;2(2):153–159.
- Marques A, Bahamondes L, Aldrighi JM, Petta CA. Quality of life in Brazilian women with endometriosis assessed through a medical outcome questionnaire. *J Reprod Med*. 2004;49(2):115–120.
- Sepulcri RP, Amaral VF. Depressive symptoms, anxiety, and quality of life in women with pelvic endometriosis. *Eur J Obstet Gynecol Reprod Biol*. 2009;142(1):53–56.
- Souza CA, Oliveira LM, Scheffel C, et al. Quality of life associated to chronic pelvic pain is independent of endometriosis diagnosis: a cross-sectional survey. *Health Qual Life Outcomes*. 2011;9:41.
- Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group. *Psychol Med*. 1998;28(3):551–558.
- Pocock SJ. *Clinical Trials – A Practical Approach*. Chichester: John Wiley and Sons; 1983.
- Fleck MP, Louzada S, Xavier M, et al. [Application of the Portuguese version of the abbreviated instrument of quality of life WHOQOL-BREF]. *Rev Saude Publica*. 2000;34(2):178–183.
- Rosen R, Brown C, Heiman J, et al. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther*. 2000;26(2):191–208.
- Thiel Rdo R, Dambros M, Palma PC, Thiel M, Riccetto CL, Ramos Mde F. [Translation into Portuguese, cross-national adaptation and validation of the Female Sexual Function Index]. *Rev Bras Ginecol Obstet*. 2008;30(10):504–510.
- Wiegel M, Meston C, Rosen R. The female sexual function index (FSFI): cross-validation and development of clinical cutoff scores. *J Sex Marital Ther*. 2005;31(1):1–20.
- Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361–370.
- Botega NJ, Pondé MP, Medeiros P, Lima MG, Guerreiro CA. [Validation of the Hospital Anxiety and Depression Scale (HADS) in epileptic outpatients]. *J Bras Psiquiatr*. 1998;47:285–289.

26. Nelder JA, Wedderburn RW. Generalized linear models. *J R Stat Soc Ser A Stat Soc.* 1972;135(3):370–384.
27. Mellado BH, Falcone AC, Poli-Neto OB, Rosa E Silva JC, Nogueira AA, Candido-Dos-Reis FJ. Social isolation in women with endometriosis and chronic pelvic pain. *Int J Gynaecol Obstet.* 2016;133(2):199–201.
28. Miller-Matero LR, Saulino C, Clark S, Bugenski M, Eshelman A, Eisenstein D. When treating the pain is not enough: a multidisciplinary approach for chronic pelvic pain. *Arch Womens Ment Health.* 2016;19(2):349–354.
29. Grandi G, Xholli A, Ferrari S, et al. Intermenstrual pelvic pain, quality of life and mood. *Gynecol Obstet Invest.* 2013;75(2):97–100.
30. Roth RS, Punch M, Bachman JE. Psychological factors in chronic pelvic pain due to endometriosis: a comparative study. *Gynecol Obstet Invest.* 2011;72(1):15–19.
31. Facchin F, Barbara G, Saita E, et al. Impact of endometriosis on quality of life and mental health: pelvic pain makes the difference. *J Psychosom Obstet Gynaecol.* 2015;36(4):135–141.
32. Caruso S, Iraci Sareri M, Casella E, Ventura B, Fava V, Cianci A. Chronic pelvic pain, quality of life and sexual health of women treated with palmitoylethanolamide and  $\alpha$ -lipoic acid. *Minerva Ginecol.* 2015;67(5):413–419.
33. Caruso S, Iraci M, Cianci S, Casella E, Fava V, Cianci A. Quality of life and sexual function of women affected by endometriosis-associated pelvic pain when treated with dienogest. *J Endocrinol Invest.* 2015;38(11):1211–1218.
34. Caruso S, Iraci M, Cianci S, et al. Comparative, open-label prospective study on the quality of life and sexual function of women affected by endometriosis-associated pelvic pain on 2 mg dienogest/30  $\mu$ g ethinyl estradiol continuous or 21/7 regimen oral contraceptive. *J Endocrinol Invest.* 2016;39(8):923–931.
35. Abdo CH, Oliveira WM Jr, Moreira ED Jr, Fittipaldi JA. Prevalence of sexual dysfunctions and correlated conditions in a sample of Brazilian women: results of the Brazilian study on sexual behavior (BSSB). *Int J Impot Res.* 2004;16(2):160–166.
36. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: prevalence and predictors. *JAMA.* 1999;281(6):537–544.
37. Avci D, Dogan S. The impact of sexual dysfunction on quality of life of patients with asthma in Turkey. *Sex Disabil.* 2017;35(1):107–118.
38. Tepavcevic DK, Kostic J, Basuroski ID, Stojisavljevic N, Pekmezovic T, Drulovic J. The impact of sexual dysfunction on the quality of life measured by MSQoL-54 in patients with multiple sclerosis. *Mult Scler.* 2008;14(8):1131–1136.
39. Nickel JC, Tripp D, Teal V, et al; Interstitial Cystitis Collaborative Trials Group. Sexual function is a determinant of poor quality of life for women with treatment refractory interstitial cystitis. *J Urol.* 2007;177(5):1832–1836.
40. Zhang L, Guo X, Zhang J, et al. Health-related quality of life among adults with and without hypertension: a population-based survey using EQ-5D in Shandong, China. *Sci Rep.* 2017;7:14960.
41. Al Hayek AA, Robert AA, Al Saeed A, Alzaid AA, Al Sabaan FS. Factors associated with health-related quality of life among Saudi patients with type 2 diabetes mellitus: a cross-sectional survey. *Diabetes Metab J.* 2014;38(3):220–229.
42. Vathesatogkit P, Sritara P, Kimman M, et al. Associations of lifestyle factors, disease history and awareness with health-related quality of life in a Thai population. *PLoS One.* 2012;7(11):e49921.
43. Papuć E, Stelmasiak Z. Factors predicting quality of life in a group of Polish subjects with multiple sclerosis: accounting for functional state, socio-demographic and clinical factors. *Clin Neurol Neurosurg.* 2012;114(4):341–346.
44. Costa TL, Oliveira DC, Gomes AM, Formozo GA. Quality of life and people living with AIDS: relationship with sociodemographic and health aspects. *Rev Lat Am Enfermagem.* 2014;22(4):582–590.
45. Sathvik BS, Parthasarathi G, Narahari MG, Gurudev KC. An assessment of the quality of life in hemodialysis patients using the WHOQOL-BREF questionnaire. *Indian J Nephrol.* 2008;18(4):141–149.
46. Ghasemi E, Mohammad Aliha J, Bastani F, Haghani H, Samiei N. Quality of life in women with coronary artery disease. *Iran Red Crescent Med J.* 2014;16(7):e10188.

## Journal of Pain Research

### Publish your work in this journal

The Journal of Pain Research is an international, peer reviewed, open access, online journal that welcomes laboratory and clinical findings in the fields of pain research and the prevention and management of pain. Original research, reviews, symposium reports, hypothesis formation and commentaries are all considered for publication.

Submit your manuscript here: <https://www.dovepress.com/journal-of-pain-research-journal>

Dovepress

The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.