Women in pain : the course and diagnostics of chronic pelvic pain

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Predictors of outcome in a cohort of women with chronic pelvic pain – A follow-up study

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ABSTRACT

Background: Chronic pelvic pain (CPP) in women is a long-lasting condition.
Aim: To explore changes in pain intensity, adjustment to pain, pain appraisal and coping strategies as well as to evaluate whether baseline pain appraisals and coping strategies and their changes were associated with outcome in the long term.
Method: A follow-up study was conducted on all consecutive women who had visited a CPP-team of a university hospital. After an average period of 3.2 years 64% of them (N = 84) completed questionnaires at baseline and follow-up.
Results: A reduction in pain intensity ($p < .001$, $d = .6$), improvement in adjustment to pain (SF-36 Physical Component Summary ($p < .001$, $d = .4$) and depressive symptoms ($p < .01$, $d = .2$)), as well as a reduction in catastrophizing pain ($p < .01$, $d = .4$) and an increase in perceived pain control ($p < .01$, $d = .3$) were observed. Neither biographic nor clinical variables were related with these changes. Pain appraisal and coping strategies at baseline did not predict changes from baseline in pain intensity. However, baseline levels of perceived pain control correlated with a change in depressive symptoms ($r = -.27$, $p < .05$), also after adjustment for pain intensity at baseline ($r = -.28$, $p < .05$). Changes from baseline in levels of catastrophizing pain were associated with changes in pain intensity ($r = .44$, $p < .01$), SF-36 Physical Component Summary ($r = -.34$, $p < .01$) and depressive symptoms ($r = .71$, $p < .01$).
Conclusions: At a 3 year follow-up, improvement in pain intensity in women with CPP was not associated with baseline pain appraisals and coping strategies. A reduction in catastrophizing was related to better outcome in the long term.

Introduction

Chronic pelvic pain (CPP) is a common condition in women [Mathias 1996; Grace 2004]. Of those who consult a general practitioner, only a minority is referred to secondary/tertiary care [Zondervan 1999; Grace 2004]. Gynaecologists and other medical specialists are hampered in adequate diagnostics and treatments because the aetiology of CPP is poorly understood, pathologies identified may be coincidental rather than causal and the range of effective interventions remains limited [Stones 2005]. Moreover, CPP can adversely affect daily life activities and general well-being [Grace 2006]. CPP is also a costly condition since it results in the frequent use of health care resources and absence from work [Mathias 1996; Grace 2006].

Recently, two uncontrolled follow-up studies [Lamvu 2006; Weijenborg 2007] investigated the clinical course of the condition in secondary/tertiary care CPP women. In both studies a chronicity of symptoms was confirmed. Risks for persistence like biographic variables, complaint characteristics or the kind of treatments given (medical or surgical), could not be identified. However, from studies in other chronic pain conditions, an increasing body of evidence emerges which suggests that pain appraisals and pain coping strategies can play a prominent role in the course of these complaints [Turk 2004]. For example, it has been noticed that the belief to possess the ability and resources to adapt to chronic pain, is positively related to an improvement in pain and adjustment to pain in the long term, while catastrophizing pain shows an inverse relationship. These findings have been used to develop new treatment modalities for a variety of chronic pain conditions as for instance chronic back pain, fibromyalgia and headache [Vlaeyen 2005]. If, similarly, an association between pain appraisals and pain coping on the one hand and pelvic pain severity on the other hand could explain differences in course of and adjustment to chronic pelvic pain, this would be of great value and provide further understanding about CPP in women.

Therefore, as a continuation of our previous study [Weijenborg 2007], we conducted a second follow-up study on a new cohort of CPP women. One to 6 years before at their first visit to a chronic pelvic pain team (CPP-team), all women had an initial assessment which was more extended than in the earlier study. The primary objectives were to investigate (1) the clinical course of pelvic pain by exploring changes in reported pain intensity, adjustment to pain (i.e., health related quality of life, anxiety and depression) and in pain appraisals and coping strategies between baseline and follow-up and (2) whether baseline levels of pain appraisals and pain coping and their changes from baseline were associated with pain and adjustment to pain in the long term.

Methods

Participants

All consecutive women who visited a CPP-team of the gynaecological out-patient clinic of the Leiden University Medical Center between July 2001 and January 2006, were invited to participate in the present study, conducted in the first 3 months of 2007. Eligible women were suffering from CPP at the time they were initially evaluated, had to be over 18 years of age and be able to understand, speak and write the Dutch language properly. If women were pregnant at the moment of the follow-up, they were excluded.

CPP is defined as a continuous or intermittent pain in the lower abdomen, lasting for at least six months and not exclusively relating to menstrual period or sexual intercourse [Williams 2004]. Typically, CPP women are examined by the CPP-team if, after gynaecological examination, ultrasound investigation and/or laparoscopy, no diagnosis or somatic explanation for their pelvic pain is found or if the complaint persists despite adequate treatment of the initial diagnosis. Members of the team are a gynaecologist, psychologist, dietician and physiotherapist. All women are seen once by each team member for history taking and examination, if appropriate. By this so-called integrated approach [Peters 1991] equal attention is given to the somatic, psycho-social, dietary and physiotherapeutic aspects of the chronic pelvic pain problem.

Before consultation by the team members women are asked to complete baseline questionnaires (see further). Based on all findings a particular treatment is recommended to each patient varying from pain management, physical therapy, dietary advice, medication, surgery, to a combination of these treatments or no intervention at all.

Procedure

For the present study first a letter with information about the purposes of the study was sent inviting women to complete a follow-up assessment. Those who were not interested were asked to return a form for refusal within two weeks. After this period, the other women were contacted by telephone by the first author (PW), who informed them again about the goal and practical consequences of the study and asked for participation. If women consented, a set of paper and pencil questionnaires was sent to their home addresses. Participants were compensated with a gift coupon of €15 after completing the assessment and returning their signed informed consent form. Reminders to return the questionnaires were sent twice.

Approval for this follow-up study of a cohort of women with chronic pelvic pain was obtained from the Institutional Review Board of the Leiden University Medical Center.

Measures

At baseline just before the initial CPP-team visit and at follow-up the same assessment was administered covering the following outcome measures.

Primary outcome measure

Current pain intensity was assessed using a 100 mm visual analogue scale (McGill VAS) of the McGill Pain Questionnaire Dutch Language Version (MPQ-DLV) [Vanderiet 1987; Van der Kloot 1989] with the endpoints "no pain" on the left side and "worst pain" on the right side. Just like the original MPQ of Melzack [Melzack 1975], the Dutch version has good psychometric properties [Vanderiet 1987].

Secondary outcome measures

Adjustment to pain

(a) Health related quality of life was measured using the Rand-36 [Van der Zee 1994]- a Dutch version of the Medical Outcome Study (MOS) 36-Item Short-Form Health Survey (SF-36) [Ware 1992]. The psychometric properties of this questionnaire have been found to be adequate [Van der Zee 1996; Essink-Bot 1997; Aaronson 1998]. Aggregation of the 8 domains (i.e., physical functioning, social functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, emotional well-being or mental health, vitality, bodily pain and general health perception) yields 2 measures: the Physical Component Summary (PCS) and the Mental Component Summary (MCS) score, assessing physical and mental health respectively [Ware 1994]. These component summaries are calculated according to the instructions of the user's guide (www.sf-36.org) using the normative data for women from a Dutch population [Aaronson 1998]. In this normbased scoring each scale has the same average (50) and the same standard deviation (10). Anytime a scale score is below 50, health status is below average [Ware 2000].
(b) The presence of anxiety and depressive states was assessed using the Dutch version of the Hospital Anxiety and Depression Scale (HADS) [Zigmond 1983]. This questionnaire consists of two 7-item scales: one for anxiety and one for depression both with a score range of 0-21. Higher scores represent higher levels of symptoms of anxiety or/and depression. The questionnaire is validated for the Dutch language and has good psychometric properties [Spinhoven 1997].

Pain appraisals and pain coping strategies

To assess different pain appraisals and coping strategies related to pain, the Pain Coping and Cognition List (PCCL) [Stomp-van den Berg 2001], was used. The PCCL aims to measure cognitions related to pain in a comprehensive way and covers appraisals (i.e., attributions and expectancies) as well as cognitive coping strategies [Spinhoven 2004]. This 42-item questionnaire consists of 4 subscales: Pain Catastrophising (i.e., negative thoughts about the catastrophical consequences of pain), Pain Coping (i.e., primarily cognitive strategies for coping with pain such as diverting attention, ignoring pain or using coping self-statements), Internal Pain Control (i.e., positive expectations about personal control over pain) and External Pain Control (i.e., positive expectations about control over pain by medical specialists and significant others, for instance God). Higher scores on a particular subscale indicate a higher endorsement of the pain appraisal or coping strategy being measured. Psychometric properties of the PCCL are found to be adequate [De Gier 2004].

Predictors of outcome

In addition to the baseline levels and changes from baseline of the PCCL subscales, the following variables were assessed and used as potential predictors of pain and adjustment to pain at follow-up.

Sociodemographic, pain related and clinical variables

A questionnaire was designed and covered (1) demographic characteristics such as age, education level, current employment status (also social security and disability insurance benefit) and cohabitation status with a partner, (2) pain related variables as the duration of pelvic pain complaint and pain medication use and (3) clinical variables addressing the number of gynaecological consultations, diagnostic procedures, surgical interventions and final diagnosis, the number of consultations and treatments by other medical specialist(s), psychologist(s), physiotherapist(s) and alternative care provider(s) before the visit to the CPP-team and also between this visit and follow-up. These last variables were combined with information retrieved from patients' records. Also the referral source (medical specialist or general practitioner) was taken from these notes.

Sexual and physical abuse

To assess the prevalence of sexual as well as physical abuse during childhood and later years the 7-item Sexual and Physical Abuse Questionnaire (SPAQ) Dutch questionnaire was used. The criterion validity was found to be satisfactory [Kooiman 2002].

Statistical analysis

Descriptive statistics were calculated for all variables. Where necessary, datasets were transformed to get a normal distribution.

The first step included a description of the subjects of the study sample and a comparison of the results with those who did not consent participation, by using Chi-squared (χ^2) and Student's *t*-test for independent samples. To indicate a measure of strength of the relationship between two variables in the context of the *t*-test means, we used Cohen's *d*, defined as the difference between two means divided by the pooled standard deviation for those means. This effect size of the observed effects is comparable with others like Pearson's *r*, odds ratio (OR) etc. According to Cohen [Cohen 1988] .2 is indicative of a small effect, .5 a medium and .8 a large effect. In the second step changes between baseline and follow-up measurements of the primary and secondary outcome measures were evaluated by using Student's *t*-tests for dependent samples and Chi-squared (χ^2) tests, in case of respectively continuous or dichotomous variables. The third step investigated the association between a change in the primary and secondary outcome measures (current pain intensity and adjustment to pain) on the one hand and baseline variables i.e., demographic, pain related and clinical variables on the other hand. For the analyses Pearson product-moment correlation coefficients (*r*) and Student's *t*-test for independent samples were used. For changes in primary and secondary outcome measures standardized residual gain scores were calculated by removing from the follow-up and hence from the gain the portion

that could have been predicted linearly from the baseline scores. As a fourth step, associations between baseline levels of pain appraisals and coping strategies (PCCL subscales) on the one hand and changes in primary and secondary outcome variables at follow-up on the other hand were investigated by calculating Pearson product-moment correlation coefficients (*r*), and also after controlling for baseline levels of current pain intensity by calculating partial correlations. Finally, to assess associations between changes in baseline levels of pain appraisals and coping strategies (PCCL subscales) with changes in primary and secondary outcome variables at follow-up Pearson product-moment correlation coefficients (*r*) were used.
The Statistical Package for Social Sciences version 14.0 for Windows (SPSS Inc., Chicago, Ill) was used for all analyses. The statistical significance (two sided) was set at $p < .05$.

Results

Participants

One hundred and sixty three women were eligible to participate in the study. At follow-up 3 women (1.8%) had to be withdrawn from further analyses because two were pregnant and one woman had died. Another 29 women (17.8%) could not be contacted. Baseline demographic and clinical variables of these 32 women did not differ significantly from the results of the remaining sample (N = 131). Forty-seven women (36%) refused to participate in the study of whom 32 (68%) did not give a reason. It was remarkable that 15 of these 32 (50%) women promised to participate at the moment they were telephoned, but that they did not return their assessment despite 2 reminders. The others gave motives for nonparticipation like "being without pain, less pain, too much pain" (15%), "discontent with previous CPP management" (12%) or "having no time" (5%).
The demographic and clinical characteristics at baseline of the study participants and of those who refused, are shown in Table 1. Participants were significantly older ($p < .05$, d .4) and lived more frequently together with a partner (OR: 0.380, 95% CI: 0.172-0.836). Furthermore, participants reported significantly more depressive symptoms ($p < .05$, $d = .4$) at their initial visit to the CPP-team than those who did not consent to participate in the follow-up study (this data set is not shown).

As illustrated in Table 2, the women in the study and refusers' sample underwent a variety of surgical procedures performed by gynaecologists, general surgeons and urologists, before they consulted the CPP-team. No considerable differences were observed with respect to the percentages of women who had no surgical intervention (25%) at baseline and for whom no abnormality was identified after various diagnostic procedures (50%). Also, in both samples the diagnoses as indicated in patients' records, were similar. Adhesions were found in about 25% and endometriosis with or without adhesions in about 20% of the cases, although these diagnoses were not considered to explain the chronic pelvic pain complaints. In the remaining cases other diagnoses such as myoma uteri, ovarian cyst or IBS,

Table 1 *Demographic and clinical variables of 131 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain team*

	Study sample		Refusers			
	N	**Mean (SD)**	**N**	**Mean (SD)**	***p***	***d***
Age (years)	84	40.2 (11.3)	47	36.1 (11.4)	0.046	.4
	N	**N(%)**	**N**	**N(%)**	**OR**	**95%CI**
Living with partner (yes)	83	66 (80)	47	28 (60)	0.380	0.172-0.836
Parity (yes)	84	54 (64)	47	23 (49)	0.532	0.258-1.100
Level of education low[a] (yes)	84	65 (77)	47	34 (73)	1.308	0.577-2.965
Paid employment (yes)	84	45 (54)	46	20 (43)	1.500	0.727-3.093
Disability insurance benefit (yes)	84	28 (33)	45	14 (31)	1.107	0.509-2.409
Sexual abuse history (yes)	75	30 (40)	43	14 (33)	1.381	0.628-3.035
Physical abuse history (yes)	69	14 (20)	42	9 (21)	0.933	0.364-2.394
Referral by specialist (yes)	84	74 (88)	47	43 (92)	0.688	0.203-2.329
Gynaecological surgery (yes)	84	62 (74)	47	34 (72)	1.078	0.483-2.406
Other medical specialist(s) (yes)	84	48 (57)	47	22 (49)	1.515	0.739-3.105
Endo and/or adh[b] (yes)	84	33 (39)	47	17 (36)	1.142	0.545-2.390
Psychological care (yes)	84	12 (14)	47	8 (17)	0.813	0.306-2.156
Physiotherapeutic care (yes)	84	33 (39)	47	22 (47)	0.735	0.358-1.512
Alternative care (yes)	84	24 (29)	47	15 (30)	0.853	0.393-1.852

[a] level of education low: primary school, special education, lower secondary education (vocational and general); high: upper secondary vocational education, higher professional education, pre-university, university.
[b] endometriosis and/ or adhesions diagnosed; *d* =.2: small effect; *d* =.5: medium effect.

Table 2 *Number of surgical interventions in 131 women with Chronic Pelvic Pain prior to their initial visit to a Chronic Pelvic Pain team and in 84 women between the initial assessment and follow-up*

	Study sample (N=84) N (%)	**Refusers (N=47) N (%)**	**Follow-up (N=84) N (%)**
None	22 (26)	13 (28)	65 (77)
Appendectomy	30 (36)	10 (21)	1 (1)
Laparoscopy diagnostic	65 (77)	26 (55)	9 (11)
Laparoscopy adhesiolysis	7 (8)	3 (6)	0 (0)
Laparoscopy (cystectomy.adnexectomy)	21 (25)	10 (22)	4 (5)
Hysterectomy	18 (21)	14 (30)	6 (7)
Laparotomy (+ adhesiolysis)	42 (50)	10 (22)	3 (4)
Hysteroscopy, D&C	9 (11)	3 (6)	2 (2)
Urethrotomy	2 (2)	1 (2)	2 (2)
Other	18 (21)	3 (6)	3 (4)
Total	234 (278)[a]	93 (197)[a]	30 (36)

[a] For most women more than 1 surgical intervention was reported and documented.

were reported. For further analyses the diagnoses were reduced into 2 groups: those women with endometriosis and/or adhesions versus those women with other or no pathology.

Change in primary outcome measure

Table 3 shows that the mean scores for current pain intensity decreased significantly from baseline ($p < .001$, $d = .6$) after a mean follow-up period of 3.2 years (SD = 1.3, range 1-6). Forty percent of the participants reported a reduction in pain intensity of at least 50%, reflecting a substantial and clinically meaningful improvement [Johnson 2004; Dworkin 2008]. However, only 17 women (20.2%) said that they had recovered from pelvic pain as they reported to suffer pain for less than three months during the last year [Weijenborg 2007]. Seven of these 17 women (8.3% of the total sample) stated full recovery (no pain at all).

Change in secondary outcome measures

Between baseline and follow-up we observed a significant improvement in adjustment to pain, particularly for the SF-36 PCS score ($p < .001$, $d = .4$) and depressive symptoms ($p < .01$, $d = .2$). In addition, a significant reduction in the mean values of the PCCL subscale catastrophizing ($p < .01$, $d = .4$) and a significant improvement in the subscale internal pain control ($p < .01$, $d = .3$) were found.

Table 3 *Current pain intensity (McGill VAS), pain medication use, quality of life summary scales (SF-36), anxiety and depression scores (HADS) and pain appraisal and pain coping (PCCL) at baseline and follow up for 84 women with Chronic Pelvic Pain*

	Baseline N (%)	**Follow-up N (%)**	**OR**	**95% CI**
Pain medication (yes)	64 (77)	48 (59)	1.759	0.625-4.955
	Mean (SD)	**Mean (SD)**	***p***	***d***
McGill VAS (mm)(0-100)	50.4 (26.5)	34.8 (28.2)	0.000	.6
SF-36 summary scale				
Physical component (PCS)	36.4 (9.4)	40.2 (9.8)	0.000	.3
Mental component (MCS)	39.0 (9.5)	41.1 (10.4)	0.119	.3
HADS				
Anxiety	6.6 (4.0)	6.9 (4.4)	0.491	.1
Depression	6.4 (4.5)	5.5 (4.9)	0.008	.2
PCCL				
Catastrophizing	3.2 (1.0)	2.8(1.2)	0.002	.4
Coping	3.5 (1.0)	3.6 (1.0)	0.806	.0
Internal Pain control	3.0 (1.0)	3.4 (1.0)	0.001	.3
External Pain control	2.9 (1.0)	2.7 (1.0)	0.056	.2

McGill VAS, McGill Visual Analogue Scale; HADS, Hospital Anxiety and Depression Scale; PCCL, Pain Coping and Cognition List; SD, Standard Deviation; *d* =.2: small effect; *d* =.5: medium effect; *d* =.8: large effect.

Predictors of outcome

Correlation analyses revealed that none of the demographic variables at baseline such as age, living together with a partner, level of education, being employed or getting disability insurance fees, were associated with changes in current pain intensity and changes in adjustment to pain (i.e., SF-36 PCS score and depressive symptoms). In addition, no associations were found between outcome and baseline pain related variables like duration of pelvic pain and pain medication use. Clinical factors such as the number and kind of medical consultations, treatments or surgical interventions and a diagnosis of endometriosis and/or adhesions assessed at baseline and reported at follow-up were also not related to the outcome (see also Table 2).

Furthermore, as shown in Table 4, changes in current pain intensity were not related to one of the PCCL subscales measured at baseline.This finding indicated that baseline pain appraisals or coping strategies did not predict improvement in pain intensity at follow-up. However, baseline levels of the PCCL subscale internal pain control were significantly and negatively associated with changes in depressive symptoms (r = -.273, $p < .05$), also after adjustment for baseline pain intensity (r = -.275, $p < .05$). This result showed that independently of baseline pain intensity scores, women who at baseline perceived themselves as being more effective in pain control, reported at follow-up to feel less depressed. Moreover, significant associations were found between changes in the PCCL subscales catastrophizing and internal pain control on the one hand and changes in pain intensity and adjustment to pain on the other hand. These results implied that a decrease in the levels of catastrophizing and an improvement of perceived pain control were related to an improvement from baseline to follow-up in pain intensity, health related quality of life

Table 4 *Pearson Moment Correlation Coefficient between subscales of the Pain Coping and Cognition List (PCCL) assessed at baseline and their changes on the one hand and changes in outcome measures on the other hand, adjusted for baseline scores*

Baseline	Rgs VAS	Rgs PCS	Rgs HADS-D
Catastrophizing[a]	-.006 (-.063)	-.038 (-.008)	.020 (.042)
Coping [a]	.067 (.136)	-.088 (-.065)	-.044 (-.048)
Internal Pain Control [a]	-.001(-.006)	-0.19 (-0.72)	-.273* (-.278*)
External Pain Control[a]	-.030 (-.016)	.072 (.132)	.060 (.030)
Rgs Cata [b]	.477** (.444**)	-..439** (-.341**)	.758** (.708**)
Rgs Internal Pain [c]	-.354** (-.176)	.355** (.186)	-.300** (-.051)

Rgs: residual gain score; VAS: MPQ-VAS; PCS: Physical Component Summary; HADS-D: HADS subscale depression; Cata: Catastrophizing; Internal Pain: Internal Pain Control.

* significant at 0.05 level; ** significant at 0.01 level

[a] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for baseline scores of the MPQ VAS.

[b] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for changes in internal pain control

[c] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for changes in catastrophizing.

especially physical health and depressive symptoms. Because the changes for catastrophizing pain and internal pain control were negatively and significantly correlated in this sample of CCP women (r = -.388, $p < .01$), the analyses were repeated while controlling for changes in internal pain control and catastrophizing respectively. Changes in catastrophizing were still significantly correlated with outcome, after controlling for changes in internal pain control, but changes in internal pain control were not associated with outcome, after controlling for changes in the levels of catastrophizing. Therefore, it could be inferred that the association between changes in internal pain control and changes in pain and adjustment to pain, was a mediated consequence of changes in catastrophizing.

Discussion

After a mean follow-up period of 3.2 years we found in a cohort of 84 women with chronic pelvic pain that from baseline current pain intensity decreased and adjustment to pain improved. Also compared to baseline, women were less inclined to catastrophize their pain and perceived themselves as being more effective in pain control at follow-up. We found that a reduction in pain intensity was not associated with any of the baseline pain appraisals and pain coping strategies. However, independently from baseline pain intensity, women with higher expectations to have personal control over pain at baseline felt less depressed at follow-up. Also, a decrease in catastrophizing thoughts about the consequences of pain was related to an improvement in pain and adjustment to pain as reported between baseline and follow-up.

Our current findings illustrate the potential role of pain catastrophizing and internal pain control in the prediction of pain intensity and adjustment to pain in the long term in women with chronic pelvic pain. So far, other studies on chronic pelvic and abdominal pain studying a possible association between these factors and outcome are scarce. In line with our results Norman [Norman 2004] observed that baseline catastrophizing was not independently related to outcome in a randomised controlled trial investigating the effect of disclosure (i.e. writing therapy) on pain and disability in CPP women. Also Drossman [Drossman 2000] found that baseline levels of perceived pain control predicted a better health outcome at a 1 year follow-up in female patients suffering gastro-intestinal pain disorders. Furthermore, our findings that changes in catastrophizing between baseline and follow-up were associated with changes in pain and adjustment to pain, have also been reported in treatment outcome studies of other chronic pain conditions as chronic back pain [Spinhoven 2004], general chronic pain [Jensen 2001], fibromyalgia [Nielson 2004]. However, these results were not observed in a randomized clinical trial in patients with irritable bowel symptoms (IBS) [Lackner 2007].

Considering the course of pain in CPP women, the results of our present study concur with findings of our previous report about the clinical course of chronic pelvic pain in

72 CPP women [Weijenborg 2007]. In both studies, we observed a significant decrease in current pain intensity from baseline with a medium effect size (respectively $d = .6$ and $d = .4$) at an average of 3 year follow-up. Not any of the demographic, pain related or clinical variables such as the number and kind of medical consultations, treatments or surgical interventions assessed at baseline or reported at follow-up, were associated with outcome. These results are also consistent with the findings of Lamvu [Lamvu 2006] who observed at a 1 year follow-up that the mean score for pain intensity of a cohort of 370 CPP women in a pain specialty clinic decreased significantly irrespective of the treatments given.

Moreover, in our present study we evaluated changes from baseline in adjustment to pain and found significant improvement in health related quality of life especially physical health and depressive symptoms. Our findings could be compared with the results of other CPP studies that measured these variables, although a thorough comparison is hampered by design, sample and measurement differences between studies. Substantial improvement in health related quality of life (i.e., SF-36 domains bodily pain, vitality, physical and social functioning and role limitations physical) was reported at a 1 year follow-up of 100 patients suffering abdominal pain and adhesions after a diagnostic laparoscopy with or without adhesiolysis [Swank 2003]. Treatment of CPP with sertraline resulted in a significant improvement of the general health perception domain of the SF-36 and a significant decrease in the SF-36 role limitations emotional domain at the end of a 3 months study while no changes in the SF-36 domains were found in those women allocated to the placebo condition [Engel 1998]. Regarding depressive symptoms no changes in depression scores were noticed at a 1 year follow-up study of CPP patients [Lamvu 2006] and at the end of a 3 months' treatment outcome study in CPP women allocated to sertraline or placebo [Engel 2003]. However, an improvement in depression scores was encountered 4-9 months after ultrasound counseling as well as in the "wait and see" condition following a negative laparoscopy [Ghaly 1994] and also at a 12 months follow-up after the end of treatment with gosereline or medoxyprogesterone acetate [Soysal 2001]. So, an improvement in health related quality of life and depressive symptoms was examined not only in our study, but also in some of these treatment outcome and follow-up studies in CPP women.

However, our findings have to be interpreted with caution. First, we do not know which specific factor(s) caused the improvement from baseline found in reported pain intensity, adjustment to pain and pain appraisals. As indicated by Whitney [Whitney 1992], when a patient seeks treatment for a pain condition, subsequent improvement may be due to (1) specific effects of treatment (i.e., medication or a surgical procedure), (2) non-specific effects of treatment as for instance the provider's attitude towards the patient, the faith of the patient in treatment etc. and (3) "regression to the mean" indicating the phenomenon that a variable that is extreme on its first measurement will tend to be closer to the centre of the distribution on later measurement [Davis 1976; Whitney 1992]. It is unlikely that changes in pain intensity and secondary outcome measures as observed in our study, can be explained by the effects of specific interventions because we did not find an as-

sociation between outcome and the number or kind of treatments or surgical procedures reported at the first assessment or between that time and follow-up. Also, because we did not study patient-provider interactions or patient expectations as contributors to the effect of treatment, we cannot assign these non-specific factors as an explanation for our findings. However, we did observe that changes in pain intensity and adjustment to pain were associated with patients' pain appraisals. Still, it is possible that our findings could be explained by a regression to the mean. It is known that CPP women might seek treatment when there is a flare-up in the level of pain or when the level of pain is no longer tolerable. Over time pain intensity tends to decrease naturally, independently of the kind of diagnostics and treatments [Whitney 1992].

Second, the correlational nature of the findings between baseline pain appraisals and their changes on the one hand and improvement in pain intensity and adjustment to pain on the other hand, precludes conclusions concerning the causality of relationships between variables. For instance: the finding that an improvement in pain intensity from baseline was significantly related to a decrease in the levels of catastrophizing pain could also be valued vice versa or be explained by an interaction with another factor, for instance neuroticism [Goubert 2004].

Third, the interpretation of our findings could also be limited by the potential for non-participation bias, although the response rate in our present study of 64% is high in comparison with a 38% in the follow-up study of Lamvu [Lamvu 2006]. In addition, we could not indicate a specific reason why we found significant differences at baseline for age, living together with a partner and depression scores between participants and refusers.

Finally, the results of our present study cannot be generalized to all women with CPP as this study was conducted in a secondary referral centre, resulting in a study sample from a highly selected population. Our study sample however, was representative for a chronic pain population as the health related quality of life scores (SF-36 domains) reported by all women who were enrolled in our study, were comparable with the results in 2 other Dutch chronic pain populations in secondary and tertiary care [Swank 2003; Lamé 2005].

Nonetheless, our present results can have important implications. We showed that CPP in women who seek medical advice in secondary care, is a long-lasting condition. This knowledge should not only guide the information given to patients in clinical practice but should also facilitate the interpretation of results in treatment outcome studies. Furthermore, the impact of chronic pelvic pain on quality of life is apparent and needs attention of health care professionals [Stones 2000]. Moreover, as our findings have to be estimated as a first step to unravel an association between cognitive factors on the one hand and prognosis of CPP and adjustment to pain in CPP women on the other hand, future studies are needed to replicate our findings.

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