



# The relationship between pain experience and personality factors in Chronic Pelvic Pain



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COI::Please see Demetriou, L., Coxon, L., Krassowski, M., Rahmioglu, N., Arendt-Nielsen, L., Aziz, Q., ... & Vincent, K. (2022). Deep phenotyping of women with endometriosis-associated pain and bladder pain syndrome: the TRIIP (Translational Research in Pelvic Pain) study protocol. *medRxiv*.



## Introduction

The relationship between pain and personality has been a topic of interest for over a century. There is good evidence for an association between some personality dimensions and pain experience, but the nature of these complex relationships is not as yet well understood.

There is ample evidence that experiences of dismissal of symptoms are highly prevalent for women with chronic pelvic pain resulting in delays in accessing appropriate health care and undermining women's confidence in their symptoms and bodies [1&2]. Some specific psychological constructs, such as 'neuroticism' and 'pain catastrophising', have the potential to add to this: if they are not well understood, they may be interpreted as invalidating pain experience, suggesting it is 'all in the mind' and limiting health care options. Understanding the complexity of these constructs and their links with a wide range of biopsychosocial factors is essential for meaningful and sensitive interpretation.

The relationship between pain and personality is likely bi-directional, with pain exacerbating certain personality traits and vice versa [3]. Historically, personality factors have been considered to be stable over time but there is growing evidence that they are amenable to change and can be effectively targeted through psychological therapy [4]. Central sensitisation, which is defined as "increased responsiveness of nociceptive neurons in the central nervous system to either normal or subthreshold afferent input" may be associated with sensitisation in broader context, including sensitivity to emotional states [5] and therefore the personality factors which include an increased tendency to experience negative emotions (neuroticism).

Understanding the relationship between pain and personality may provide valuable insights into the underlying mechanisms of chronic pain and inform treatments.

## This study aims to:

- Investigate the relationship between pain experience and personality by (1) comparing women with CPP with a non-pain control group and (2) exploring the associations between personality dimensions and pain experience within CPP population

## Methods

Recruitment and data collection occurred at three sites with trained researchers: University of Oxford, UK; Boston Children's Hospital, USA; and IBMC, Portugal. All participants were women aged 18-50 who were not currently pregnant or lactating

We have 4 participant chronic pelvic pain (CPP) groups: endometriosis-associated pain (EAP); endometriosis-associated pain with comorbid bladder pain (EABP); bladder pain syndrome (BPS); pelvic pain without bladder pain or diagnosis of endometriosis (PP). The control group (CON) had no history of endometriosis, no urinary symptoms and no/minimal pelvic pain.

All participants gave informed consent. Ethics reference 19/YH/0030.

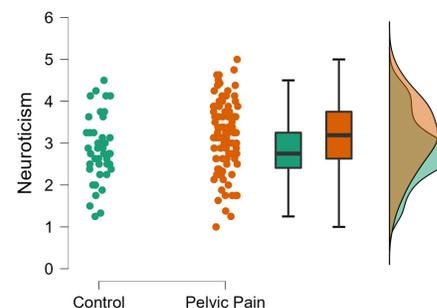
Questionnaires were completed either on paper or online. RedCap was used for online data. Parametric assumptions were explored and statistical methods were selected accordingly. Bonferroni corrections for multiple comparisons were made. (Kruskall-Wallis and Mann-Whitney U tests).

## Results

105 women with CPP completed the questionnaires and 50 women were recruited to the control group.

### Do women with CPP differ on personality dimensions compared to a non-pain control group?

Compared to controls, women with pelvic pain reported significantly higher neuroticism scores (CPP mean=3.17, SD=0.84; CON mean=2.84, SD=0.37; t=-2.157, P=0.033).



|                   | t     | df  | p     | Cohen's d |
|-------------------|-------|-----|-------|-----------|
| Extraversion      | 1.021 | 140 | 0.309 | 0.188     |
| Agreeableness     | 1.128 | 140 | 0.261 | 0.207     |
| Conscientiousness | 0.662 | 140 | 0.509 | 0.122     |
| Openness          | 0.154 | 140 | 0.878 | 0.028     |

There were no significant differences between women with pelvic pain and controls on the other personality dimensions.

Note. Student's t-test.

### Is type of pelvic pain experienced associated with personality dimensions?

Analysis of Variance (ANOVA) indicated no differences between the pain groups in any of the personality dimensions suggesting it is appropriate to consider personality for all pain groups combined.

## Conclusions

- Women living with pelvic pain experience significantly higher levels of negative emotion (neuroticism) compared to women who are not living with pelvic pain.
- Lower pain-related quality of life is reported by those experiencing higher levels of negative emotion alongside pelvic pain.
- Women with pelvic pain who also have difficulties with distractibility and focusing (conscientiousness) experience lower pain related quality of life, but this personality factor did not differ between controls and pain groups.
- Longitudinal studies are needed to clarify whether pain experiences result in changes in sensitivity and/or whether pre-existing sensitivity to negative emotions in some way predispose individuals to chronic pain.

## Questionnaires

- Big Five Inventory (Personality)
- Pain Catastrophising Scale (PCS)
- Anxiety and Depression (HADS)
- Pain Quality of life (SF36-Pain)
- Pain intensity (SF-MPQ-2)

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### Is pain experience associated with personality factors in women with CPP?

- Worse pain-related quality of life (lower scores on SF36-Pain domain) was associated with higher levels of neuroticism (r=-0.220, p=0.029)
- Higher pain-related quality of life (higher scores on SF36-Pain domain) was associated with higher levels of conscientiousness (r=0.260, p=0.009)
- No association was found between pain-related quality of life (SF36-Pain domain) and other personality dimensions (extraversion, agreeableness, and openness)
- No association was found between pain rating (SF-MPQ-2) and any personality dimension

### Is pain catastrophising associated with personality factors in women with CPP?

- Pain catastrophising and neuroticism were positively correlated
- No association was found between pain catastrophising and any other personality dimension

| Variable             |                | Extraversion | Agreeableness | Conscientiousness | Neuroticism | Openness |
|----------------------|----------------|--------------|---------------|-------------------|-------------|----------|
| Pain Catastrophising | Spearman's rho | -0.005       | -2.431e-4     | -0.171            | 0.394       | 0.078    |
|                      | p-value        | 0.964        | 0.998         | 0.092             | < .001*     | 0.444    |

### Do personality factors predict additional variance in pain related quality of life after the variance associated with mood have been accounted for?

Only anxiety was a significant predictor of pain related quality of life (t=3.77, p<0.001). Depression, neuroticism and conscientiousness did not account for additional variance using stepwise regression.

## Relevance for patient care

Unsurprisingly there is an tendency to experience negative emotion when living with chronic pelvic pain, and experiences of negative emotion are associated with lower quality of life. This finding indicates a role for psychological interventions as well as pharmacological treatments that target negative emotional states.

The finding that 'conscientiousness' is associated with pain related quality of life requires further investigation. Ability to plan and focus attention may be disrupted by pain; interventions to develop these skills (e.g. attention training and problem solving) and support women to engage in activities that are important to them despite ongoing pain is likely to result in improvements in quality of life.

In clinical practice, it is likely to be helpful to explore experience of negative emotions and difficulties with attention/distractibility in order to provide holistic care and support women to access help for the difficulties and challenges that commonly co-occur alongside chronic pelvic pain.

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