Title: Emotional processing and its relationship to chronic low back pain

Author: Laura Wheatley

Supervisors: Jorge Esteves PhD MA BSc DO
Hilary Abbey MSc DO
Abstract

**Objective:** To investigate the relationship between chronic low back pain (CLBP) and emotional processing, building on a pilot study by Mayall and Esteves (2010).

**Method:** The Emotional Processing Scale (EPS) questionnaire was used to compare emotional processing in two groups of 30 participants comprised of individuals with CLBP and individuals without a history of CLBP. The EPS generates an overall score, and also scores pertaining to 5 individual emotional processing factors – avoidance, suppression, unregulated emotion, impoverished emotional experience and signs of unprocessed emotion.

**Results:** At the 5% level the CLBP group scored significantly higher than the control group in overall EPS score (p = 0.02) and the sub-factor suppression (p = 0.01). It is of note that the pilot study by Mayall and Esteves (2010) also showed significantly higher scores in the CLBP group for EPS total and suppression. Further, in general, age was shown to correlate with the sub-factor avoidance (also observed by Mayall and Esteves, 2010) and males showed significantly higher levels of impoverished emotional experience than females.

**Conclusion:** The results are consistent with the pilot study by Mayall and Esteves (2010) and suggest that dysfunctional emotional processing, particularly with regards to the suppression of emotions, is associated with CLBP. Further research on a larger scale is indicated to expand upon these findings.

*Key words: chronic low back pain, pain, emotional processing, emotion, suppression, psychosomatic medicine.*
1. Introduction

Chronic low back pain (CLBP) affects populations around the world and is recognized to be a major health and economical problem (Henschke et al., 2010). Current approaches to the treatment of CLBP have limited success (Wand et al., 2011), particularly those based on the biomedical model of health care in which pain and tissue damage are considered to be synonymous (Vlaeyan and Crombez, 1999). Indeed, it is well documented that tissue damage is not a prerequisite for pain and research has demonstrated the importance of psychosocial factors in clinical outcome for CLBP patients (e.g. Foster et al., 2010; Pincus et al., 2002). Recent research has even demonstrated CLBP to entail structural, functional, and neurochemical changes in the brain (Wand et al., 2011).

Psychological factors demonstrated to have a significant association with CLBP are catastrophizing (Meyer et al. 2009), anxiety (Pincus et al., 2002; Manchikanti et al., 2006), fear-avoidance (Brox et al., 2005), distress/depressive mood (Pincus et al., 2002; Manchikanti et al., 2006), anger (Burns et al., 2006; Carson et al., 2007), and poor coping strategies (Foster et al., 2010). However, a comprehensive overview of these factors is lacking because the majority of studies focus on one or a few factors in isolation (Foster et al., 2010; Carson et al., 2007; Manchikanti et al. 2006;), or are confounded by the interaction between the factors (Meyer et al., 2009; Pincus et al., 2002; Vlaeyan and Crombez, 1999).

As the aforementioned psychological factors are all closely linked with emotional states, they could perhaps be viewed as expressions of dysfunctional emotional
processing. ‘Emotional processing’ refers to the means by which emotional episodes are assimilated in order that their effect subsides, enabling other experiences and behaviours to occur without disruption (Rachman, 1980). Baker and colleagues (2007; 2010) have identified five factors relating to emotional processing deficits, namely avoidance, suppression, unregulated emotion, impoverished emotional experience and signs of unprocessed emotion.

Emotions lie at the interface between physical and psychological processes and for that reason impaired emotional processing may be associated not only with psychological factors, but also with physical conditions such as CLBP (Baker et al. 2010). Although the role of emotional processing could be key to understanding more fully the psychological factors involved in CLBP (Walters, 1966), there is currently limited research in this particular field. This may be because emotions occur as a spectrum of overlapping and interlinking states (Latey, 1982) and so despite various proposals of classification models (Ekman, 2005; Parrott, 2001; Plutchik, 1980), no definitive taxonomy exists. This, in combination with the difficulty of objectively measuring emotional processes, has rendered research in this field a challenging undertaking.

This study examined the way patients with CLBP process their emotions in comparison with a group of asymptomatic individuals, building on a pilot study by Mayall and Esteves (2010) in which the CLBP group showed significantly greater levels of dysfunctional emotional processing.
2. Methods

2.1 Design

The Emotional Processing Scale (EPS) questionnaire was used to compare emotional processing in two participant groups. Group A, the control group, was comprised of 30 individuals who were free of chronic pain. Group B was comprised of 30 individuals who suffered from CLBP (see Table 1).

Table 1: Summary of inclusion and exclusion criteria

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 18 years of age</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Able to communicate in English</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>No diagnosed psychopathologies in last 10 years</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>No CLBP or any other chronic pain in last 5 years</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CLBP (minimum 3 months duration)</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

2.2 Materials

The EPS questionnaire (see Appendix 1) is a 25-item self-report scale, recently validated by Baker and colleagues (2007; 2010), which measures 5 factors relating to emotional processing deficits:

1. Avoidance
2. Suppression
3. Unregulated emotion
4. Impoverished emotional experience
5. Signs of unprocessed emotion
Emotional processing ability is measured by self-rating on a continuous 10-point scale of ‘completely disagree’ to ‘strongly agree’, in relation to statements such as “I tried not to show my feelings”. There is an emphasis on relating the answers to experiences in the previous week to reduce the possibility of recall error.

There is some evidence to support the validity and internal reliability of the EPS questionnaire (Baker et al., 2011, Wilkins et al., 2009; Mehrotra, 2007; Baker et al., 2004). However, this evidence is not substantial and, moreover, the questionnaire has not been widely appraised by researchers in the field.

2.2 Procedure

Participants were recruited from the British School of Osteopathy (BSO) General Clinic and the BSO student and staff population in response to a poster and email campaign. All received Patient Information Sheets (see Appendix 2) and voluntarily took part in the study at their own expense.

Participants attended the BSO clinic for appointments with the researcher to complete the EPS questionnaire and also provided biographical data and CLBP details where applicable. Questionnaires were anonymised by reference number allocation.

2.3 Ethics

This project received ethical approval from the BSO Research and Ethics Committee.
The EPS questionnaire is designed to be psychologically non-invasive and historically there are no reported adverse reactions in participants in studies that used it, including the pilot study carried out by Mayall and Esteves (2010).

Precautions were nonetheless taken to minimise the risk of adverse emotional reactions occurring during this study and the researcher received training from Baker’s research team to ensure consistent and sensitive administration of the questionnaire.

No participants reported requirement of emotional support during or following completion of the EPS questionnaire.

2.3 Data Analysis

The null hypothesis “there is no difference in the way people with CLBP process their emotions in comparison to people without CLBP” ($\mu_A - \mu_B = 0$) was tested using independent t-tests.

Independence of EPS score from gender and age was analysed using the Mann Whitney U test and Spearman’s rho respectively.

Additional analysis of the EPS scores was undertaken to test the association between emotional processing and the CLBP data (duration and intensity of pain) using Spearman’s rho.

The significance level for all analyses was set at $p < 0.05$. 
3. Results

3.1 Descriptive statistics

A total of 60 volunteers were recruited to take part in the study. The groups had 30 participants each and did not differ significantly in terms of gender and age composition (see Table 2).

Table 2: Descriptive statistics for demographic data

<table>
<thead>
<tr>
<th></th>
<th>Group A (Control)</th>
<th>Group B (CLBP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Females</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Median Age</td>
<td>31 years</td>
<td>33 years</td>
</tr>
</tbody>
</table>

The Pearson Chi–Square test demonstrated that there was no significant difference in gender ratio between the two groups ($\chi^2 (1, N = 60) = 0.62$, $p = 0.43$).

The Mann Whitney U test showed no significant difference in age between the groups ($U = 373.00$, $p = 0.25$).

3.2 Analysis

The EPS total and the sub-factor scores in both groups were tested for normality, based on skewness ($-2 < p < 2$), kurtosis ($-2 < p < 2$), and Shapiro-Wilk ($p > 0.05$) values. All of the data were normally distributed, except the sub-factor suppression
in Group B (p = 0.045). It was therefore deemed appropriate to use the parametric t-test to compare the group scores.

Group B (CLBP) had higher mean scores than Group A (control) for EPS total and all five emotional processing factors (see Table 3).

Table 3: Group statistics

<table>
<thead>
<tr>
<th>Does the person have chronic low back pain?</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>2.99</td>
<td>1.67</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>3.84</td>
<td>1.50</td>
</tr>
<tr>
<td>Suppression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>3.16</td>
<td>1.68</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>4.43</td>
<td>2.03</td>
</tr>
<tr>
<td>Unprocessed Emotion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>3.94</td>
<td>1.81</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>4.67</td>
<td>2.19</td>
</tr>
<tr>
<td>Unregulated Emotion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>2.91</td>
<td>1.55</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>3.72</td>
<td>2.01</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>2.97</td>
<td>1.65</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>3.68</td>
<td>1.76</td>
</tr>
<tr>
<td>Impoverished Emotion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic pain</td>
<td>30</td>
<td>1.97</td>
<td>1.11</td>
</tr>
<tr>
<td>Chronic low back pain</td>
<td>30</td>
<td>2.69</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Independent t-tests showed that EPS total and the sub-factor suppression scores were significantly higher in the CLBP group compared to the control group. All other sub-factor comparisons were not significant (see Table 4).
Table 4 – T-test results

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS Total</td>
<td>-2.44</td>
<td>58</td>
<td>0.02*</td>
</tr>
<tr>
<td>Suppression</td>
<td>-2.65</td>
<td>58</td>
<td>0.01*</td>
</tr>
<tr>
<td>Unprocessed emotion</td>
<td>-1.41</td>
<td>58</td>
<td>0.17</td>
</tr>
<tr>
<td>Unregulated emotion</td>
<td>-1.74</td>
<td>58</td>
<td>0.09</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-1.62</td>
<td>58</td>
<td>0.11</td>
</tr>
<tr>
<td>Impoverished emotion</td>
<td>-2.002</td>
<td>58</td>
<td>0.05</td>
</tr>
</tbody>
</table>

* p < 0.05

3.3 Confounding variables analysis

No significant associations between gender and EPS scores were found, except for the sub-factor impoverished emotional experience (p = 0.01), in which males scored significantly higher than females.

No significant correlations between age and EPS scores were found, except for the sub-factor avoidance (p = 0.01), which increased with age.

Associations within the CLBP group between EPS scores and duration/intensity of CLBP were tested with no significant correlations found.
4. Discussion

4.1 Emotional processing and CLBP

In this study the CLBP group scored significantly higher than the control group in EPS total and the sub-factor suppression, thereby rejecting the null hypothesis “there is no difference in the way people with CLBP process their emotions in comparison to people without chronic pain”. These results are in line with those reported by Mayall and Esteves (2010) in the pilot study and thus provide further evidence of a link between CLBP and impaired emotional processing.

The EPS total score is a cumulative score of the 5 sub-factors, and it is of interest that this score was significantly different between the groups though only one of the five sub-factors, suppression, showed significant difference. The mean scores for the other 4 sub-factors, although not significantly different, were however all higher in the CLBP group than in the control group, with impoverished emotion at the cut-off point for a 5% significance test (p = 0.05). This trend could be indicative of further potential differences that may be revealed with larger sample sizes.

EPS total

Higher EPS scores indicate relatively dysfunctional emotional processing and so the results suggest that those with CLBP are more likely to be ill-equipped to process their emotions than pain-free individuals. An impaired ability to effectively assimilate upsetting emotional episodes prolongs their effects and disrupts subsequent experiences and behaviours (Rachman, 1980). Persistent states of
anxiety and depression have been shown to reduce pain tolerance (Carter et al., 2002), therefore potentially both predisposing and maintaining chronic pain states. In addition, physiological responses to stress via the hypothalamus-pituitary-adrenal axis and autonomic nervous system (Pruessner et al., 2008) lead to muscular tension, vasoconstriction, ischaemia and release of pain producing substances (Keefe, 1986), all of which can enhance and perpetuate pain.

Postures characteristic of emotional distress may explain how CLBP can be initiated and/or exacerbated in response to negative feelings. In anxiety and anger the low back musculature is stressed as the body is braced for fight or flight. Conversely, those suffering from depression may lack the strength to "stand up to life" and strain the low back in their struggle to maintain uprightness (Walters, 1966). These observations are supported by the findings of Lewis and colleagues (2012), who demonstrated that paraspinal muscle activity is associated with anxiety and depression in CLBP patients.

The described stresses from both physiological and mechanical sources may upset the balance of muscular activity in the low back, in that the fine gradation of contraction and relaxation of the lumbar spine musculature is replaced by aberrant trunk movements and altered connective tissue function (Langevin et al., 2011). This myofascial strain picture implicates the thoracolumbar fascia and it is pertinent that fascia has been shown to actively contract under autonomic control, showing increasing levels of stiffness during both mechanically and emotionally stressful situations (Schleip, 2005).
Suppression

CLBP sufferers scored significantly higher in the sub-factor suppression than those in the control group. Suppression is the action of controlling emotional expression and is a coping strategy employed to limit personal exposure to unpleasant feelings by shifting focus to the control of physical gestures, facial expressions and verbal utterances during emotional episodes (Goldin et al., 2008). This suppressive inhibition of feelings reduces the impact of negative emotion at a biological cost, as it is associated with rigidity and restraint within the myofascial system, as well as increased sympathetic activation of the cardiovascular system, raising blood pressure and heart rate (Goldin et al., 2008).

Suppression may be linked with CLBP through the anxiety and anger aroused in the effort to repress strong feelings. The physiological and mechanical effects of anxiety on the low back musculature were discussed in the previous section, and are supported to some degree by research carried out by Burns and co-workers (2011), who found that suppression of anger led to lower back muscle tension and an increase in systolic blood pressure.

4.2 Additional significant findings

Males and impoverished emotional experience

Males showed significantly higher scores than females in the sub-factor impoverished emotional experience, a trait characterised by blunt and dull feelings as well as a lack of awareness of emotional states.
The way emotional landscapes differ in men and women is a matter of much speculation and debate, with social, cultural, psychological and evolutionary factors at play (Fischer, 2000). The behavioural differences between males and females in Western culture are most relevant here, wherein for females it is more socially acceptable to express and discuss emotions than it is for males (Heesacker et al., 1999). This masculine socialisation process has been hypothesised to encourage men to devalue and block much of their emotional experience to comply with the requirements of society and there is evidence that men report greater levels of alexithymia and fear of intimacy than females (Fischer et al., 1997). Conjecture based on this incidental finding (also observed in the pilot study) could provide the basis for future research regarding the care of male CLBP patients.

Age and avoidance

This research found significant positive correlation of age with the sub-factor avoidance, which is the active reluctance of self-exposure to potentially negative and unpleasant emotions. This coping strategy keeps an individual in ‘safe’ territory in order to manage anxiety levels.

Research has shown that as people age they demonstrate increasing levels of avoidance; for example Charles et al. (2009) found older age to be associated with passive coping strategies in the face of interpersonal conflict. It is hypothesised that this is a protective mechanism employed to cope with the progressive challenge of increasing levels of physical and psychological pain and degeneration (La Gory and Fitzpatrick, 1992). However, because this is a cross-sectional study and not a longitudinal study, it is difficult to conclusively say whether the observed
differences in avoidance levels are age-related, as they may in fact be due to generational variations.

4.3 Implications for osteopathy

The findings of this research and the pilot study by Mayall and Esteves (2010) suggest that the role of emotional processing should not be overlooked when treating individuals with CLBP. The precise contribution of impaired emotional processing to CLBP is difficult to ascertain; it may be a contributing factor, a consequence or even a concurrent problem and the reasons for the impairment may be complex and challenging to unravel. However, facilitating patients in developing awareness and understanding of the emotional dimensions of their CLBP through osteopathic treatment (or any other mode of treatment) may nonetheless be beneficial (Craig, 1994). Improved emotional processing may decrease the length of states of emotional distress, thereby increasing the capacity for relaxation and positive emotional states, which may diminish pain.

Osteopathy is ideally placed to utilise this emerging understanding of the role of emotional processing in CLBP, since the first principle states that the body is an integration of body, mind and spirit (Still, 1902). Furthermore, the sensory landscape of the physical body provides a point of entry into the emotional domain unavailable to the talking therapies. With the establishment of a safe environment and good rapport, emotional feelings may surface and be explored through conversation and in relation to physical findings (Latey, 1996; 2000; 2001), helping patients to understand the connections between their physical pain and emotional distress. Such a psychophysical approach requires skill on the part of the
practitioner and the question therefore arises as to whether osteopathic educational institutions need to dedicate more time to aiding students in managing the emotional aspects of their patients, or whether it is an area for postgraduate specialism.

Osteopathy may also affect the emotional domain less directly, by use of manual techniques that reduce sympathetic outflow, decreasing anxiety and depressive feelings (Lindgren et al. 2010). It may be through this physical contact with the nervous system that osteopathy has given rise to numerous anecdotal examples of emotional release for patients. Moreover, a recent study measuring functional MRI response to touch massage found skin-to-skin contact to strongly activate the pregenual anterior cingulate cortex, an area of the brain also known to be activated by both opioid analgesia and placebo (Lindgren et al., 2011).

Also of relevance is recent evidence that mindfulness-based stress reduction has been found to decrease fear of emotions, suppression of anger, aggressive anger expression, worry and difficulties regulating emotions (Robins et al., 2012). As many approaches to mindfulness use physical awareness (i.e. breathing and bodily sensations) to bring the mind into the present moment, osteopathic treatment through touch and education may aid the development of such mindfulness techniques for patients.

As outlined by the General Osteopathic Council Code of Practice, it is essential for osteopaths to work within the limits of their competence and refer patients for appropriate psychological interventions if necessary.
4.4 Limitations

Pain and emotions are complex subjective experiences (Craig, 1994) and are therefore difficult to measure. As the EPS questionnaire has not been widely appraised its effectiveness as an assessment tool is debatable. There are also limitations regarding the use of psychometric questionnaires such as the EPS that use a numbered scale. Firstly, they are not comprised of meaningful intervals and have no real zero. Secondly, they are entirely subjective and dependent upon considered care and attention of participants during completion as well as interpretation of questions and the choice of answers. In this study, parametric tests have therefore been used to analyse ordinal data that are not numerical by nature and this modelling of subjective human experience by means of a purely mathematical and theoretical model must be interpreted with care.

There are further limitations regarding the samples. In addition to being small, they depended on voluntary response and were therefore not randomly selected (there was also a large number of BSO students and staff in the sample weighting it towards a particular ‘type’ of person). The taxonomy of the groups was also more complex than expected, as the definition of ‘chronic’ as 3 months or longer was inadequate (it was also necessary to stipulate the frequency of episodes of pain, set at a minimum of once per week). There arises then, a spectrum of CLBP sufferers, from those who have infrequent episodes to those who are in pain for the majority of the time. The frequency of pain may have a bearing on emotional processing deficits and so to generate more precise results the inclusion and exclusion criteria in terms of defining chronic needed to be more rigorous.
Finally, as informed consent was an ethical necessity, participants were aware of the study objectives and knew what was being assessed. This may have influenced EPS scores, as participants in both groups may have intentionally attempted to demonstrate that they do or do not have emotional processing deficits to either meet or challenge the perceived aims of the research. The study was also unable to influence other variables, such as what had happened to the participants in the week prior to completing the EPS.
5. Conclusion

This study provides preliminary evidence to support the theory that people with CLBP process their emotions less efficiently than those without CLBP, particularly with relation to the suppression of emotions. However, the observed associations alone do not allow for causal inferences to be made and the question of whether dysfunctional emotional processing is a consequence or a determinant of CLBP is as yet not established.

The findings in this study are consistent with the pilot study and are supported by research in the field, thus providing a strong case for further research into the relationship between emotional processing and CLBP. Similar studies with larger and more randomised samples in conjunction with more clearly defined inclusion/exclusion criteria are indicated in order to provide results representative of the population at large. Analysis of the effectiveness of osteopathic treatment that consciously acknowledges and integrates the emotional domain is also recommended.

Word count

3200 (excluding titles, abstract, acknowledgements and references)
Acknowledgements

Thank you to Jorge Esteves and Hilary Abbey for their incredibly generous and valuable support as supervisors on this project. Also thanks to Dan Marshall of Dorset Healthcare University NHS Foundation Trust for guidance on EPS usage, Charles Wheatley for his statistical insights and John Shaw for proofreading.
References


Emotional processing and its relationship to chronic low back pain

Participant Information Sheet

I would like to invite you to take part in my research study. Please read the following information sheet carefully to help you decide whether you’d like to participate. If there is anything that is not clear or you have any further questions please feel free to contact me.

What is the purpose of the research?
This research will investigate the relationship between emotions and chronic low back pain (CLBP). The aim of the study is to find out more about the factors involved in CLBP, in order to help osteopaths offer the most effective treatment for their patients.

Am I able to take part?
You can participate if you:

   a) Have suffered from low back pain for 3+ months
   OR
   b) Have NOT suffered from low back pain in the last 5+ years

Unfortunately you cannot take part in the study if you suffer from a diagnosed mental illness, such as clinical depression or anxiety disorder.

What will I have to do?
You will need to attend a 10 minute appointment at the British School of Osteopathy (BSO) clinic to fill out a questionnaire (unfortunately you can’t take it away due to copyright constraints). If you are receiving treatment at the BSO clinic, the appointment will be arranged to take place prior to treatment. Your participation will be anonymous and will not affect your osteopathic treatment in any way.

The questionnaire is called the Emotional Processing Scale, and has been recently developed by a clinical psychologist at Dorset Research Unit. There are 25 questions and it takes about 5 minutes to complete. You will also be asked to provide some biographical data, e.g. age and gender, and if you are in the group with CLBP you will also be asked to give brief details about your pain duration and intensity. When you attend your appointment I will be there to go through the information on this sheet with you, and there will be an opportunity for you to ask any questions you may have.

You will be able to withdraw from the study (and will not need to give a reason or suffer any consequences) at any time up to the point of completion of the interview - after this point your data will be anonymous and therefore unidentifiable.
What are the risks?
The questionnaire is designed to be psychologically non-invasive and there have been no reported adverse reactions. However, there is a small chance that it may stir up emotional feelings. Should this be the case, co-supervisor Hilary Abbey who is a senior BSO clinic tutor and qualified counsellor will be available to offer support as necessary. Her contact details are listed below.

What are the advantages and disadvantages of taking part?
Advantages:
- Your participation will help reveal more about the factors involved in CLBP
- Your participation could potentially lead to better osteopathic care for CLBP patients

Disadvantages:
- Participation is voluntary and you will have to take part at your own expense
- There is no financial reward for participation
- Individual results from the questionnaire will not be available

Anonymity and confidentiality
Your participation in this study will be anonymous and strictly confidential. Your completed questionnaire will be allocated a reference number so that it is anonymous, and only the researcher and supervisors will have access to the completed questionnaires and forms. The completed questionnaires will be stored securely in a filing cabinet at the BSO, and destroyed 6 years after completion of the study.

The anonymized raw data from this study will be shared with Dorset Research Unit to assist their further development of the Emotional Processing Scale. It may also be pooled with data from similar studies in the future.

Who is organising the research?
My name is Laura Wheatley and this study is part of my osteopathy qualification.

My supervisors are:  Mr Jorge Esteves  Email: j.esteves@bso.sc.uk  Tel: 0207 089 5346
Ms Hilary Abbey  Email: h.abbey@bso.ac.uk  Tel: 0207 089 5310

If you have any further queries or questions that are not answered on this sheet, please contact me via email at l.wheatley@bso.co.uk or call me on 07527 695390.

Thank you for your interest.