The context of litigation in evaluating physical and psychological outcomes from pain management programmes

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Abstract

Objectives: There has been extensive research in evaluating chronic pain in the context of litigation while considering the implications that it can have on healthcare outcomes and rehabilitation progress. The aim of this article is to present retrospective observational data about the levels of disability and distress reported by patients with ongoing litigation at the start and following a UK-based multi-disciplinary pain management programme (PMP) when compared with those without litigation.

Method: Between June 2014 and September 2017, 859 patients attended and completed a 16-day PMP at a tertiary-level National Health Service (UK) pain clinic. Patients were split into two groups: (1) litigation (n = 110) and (2) non-litigation (n = 749). As a part of the assessment procedure, the patients were given a battery of psychological and physical measures to complete over two time points.

Results: Patients with litigation are statistically significantly more distressed at assessment but make comparable clinically meaningful change in PMP intervention when compared with a non-litigation sample. A very small proportion of the variance in depression scores post-treatment is accounted for by the context of litigation (0.5%), which may be accounted for by employment status. There was no effect of litigation on physical outcome post-intervention.

Discussion: This article concludes that it is not appropriate to merely assume that the context of litigation results in limited positive psychological and physical outcomes post-PMP. There are some limitations to the clinical sample presented in respect to the conclusions.

Keywords

Chronic pain, pain management, psychology, outcomes, litigation, legal, pain management programme, self-management

Introduction

The definition of chronic pain is pain that persists for longer than 3 months.¹ The onset of chronic pain is related to numerous causation factors but can be associated with involvement in personal injury (e.g. workplace accidents) and clinical negligence incidents. Several studies have shown that interventions such as multi-disciplinary pain management programmes (PMPs) improve pain-related distress and disability outcomes^{2,3} in heterogeneous pain populations. However, there is evidence that these types of self-management interventions have been withheld or

delayed for individuals with ongoing litigation, which has been viewed as a context that may support the maintenance of continued disability.^{4,5}

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There is still debate in the literature evaluating chronic pain in the context of litigation, when considering the implications that it can have on healthcare outcomes and rehabilitation progress.^{6,7} There have been various explanations for the variability in study outcomes, including the suggestion that there are motives of secondary financial gain, previously coined as compensation neurosis.⁸ There is a great deal of research describing the unhelpful context of worker's compensation (in U.S and Australian populations) in reports of pain-related disability and distress. Harris et al.⁹ presented that the presence of worker's compensation (in American populations) and litigation can lead to poorer surgical outcomes. The role of employment status has been repeatedly highlighted as an important factor in reducing pain-related disability and distress. However, there are mixed discussions about the predictive value of being in receipt of worker's compensation (in US Law, workers' compensation is insurance that provides cash benefits and/or medical care for workers who are injured or become ill as a direct result of their employment) in treatment responses.^{10,11} It may not be the case that individuals primarily seeking monetary gain are intentionally limiting treatment success but that the context of unemployment is a notable factor in explaining the relationship between worker's compensation and reduced treatment effects.⁶

The process of compensation is complex and may cover both economic and non-economic losses, such as pain and suffering.¹² A study of an Australian population (non-clinical setting) identified that participants who were involved in pain-related litigation reported greater levels of pain-related disability.¹³ Moreover, Suter¹⁴ provided evidence of litigants scoring higher on pain and disability outcomes in comparison with non-litigants, concluding that both litigation and employment status presented as risk factors for pain-related distress and disability.

Spearing and Connelly¹⁵ propose in their systematic review of the literature that there is no strong evidence to support the notion in whiplash cases that compensation and the associated processes were necessarily linked to worse health outcomes. An American study by Robinson et al.¹⁶ concluded that although patients with pending litigation presented with greater distress and disability at assessment, when compared with an equivalent non-litigating group, they still made statistically significant changes following the receipt of interdisciplinary treatment, comparable with the non-litigating group.

There has been an absence of longitudinal data in this population, particularly in UK samples, making it difficult to observe outcomes and progress for those patients involved in medico-legal cases. The UK legal system does not accommodate a worker's compensation scheme and it could be suggested that other international studies,

within American and Australian populations, have an element of cultural anchoring to the legal systems and insurance systems, which may not be appropriately extrapolated to a UK clinical sample. The aims of this article are as follows:

- To describe the levels of disability and distress in litigation versus non-litigation chronic pain sample in a UK Pain Management Assessment clinic, in both those suitable and not suitable for the PMP intervention.
- To describe the demographics, employment status, pain duration and gender of a litigation versus a non-litigation group attending a UK pain service.
- To evaluate the comparative treatment gains (from a PMP) when comparing a sample of chronic pain patients with and without litigation ongoing at the time of treatment.

Method

Data are routinely collected for all patients attending the Pain Management Programme Clinic in Liverpool. Ethical approval for the management of the Pain Management Programme Registry at the National Health Service (NHS) (UK) clinic was provided by NRES Committee North West – Haydock 14/NW/96. The 16-day pain management programme is a group-based treatment based upon core cognitive behavioural therapy principles. The programme covers over 100 clinical hours of combined pain psychology, physiotherapy rehabilitation and occupational therapy sessions for 16 days over a period of 6 weeks. The format, content and professionals involved in the delivery of this pain management programme fulfil the criteria described by The British Pain Society – Pain Management Programme Guidelines.¹

Participants

Participants were patients attending an assessment clinic for a multi-disciplinary PMP in the North West of England, diagnosed with a chronic pain condition by a physician, aged over 18 years and able to provide informed consent. Chronic pain is defined as pain lasting longer than 3 months and encompassed neuropathic, musculoskeletal and other pain conditions. Exclusion criteria were as follows: being unable to understand the study protocol and provide informed consent, being too distressed to complete assessments and the presence of any comorbid degenerative conditions (e.g. multiple sclerosis and cancer-related pain). Patients were assessed by a multi-disciplinary team as part of routine clinical care, including a Clinical Psychologist, Occupational Therapist, Physiotherapist

Table 1. Description of sample comparing all patients with those deemed suitable for PMP intervention.

	All patients		Patients suitable for PMP	
	Litigation (n = 229)	Non-litigation (n = 1905)	Litigation (n = 110)	Non-litigation (n = 749)
Gender	40:60	27:73	43:57	26:74
Male:Female				
Mean age (SD) (years)	43.95 (11.3)	46.51 (13.3)	44.3 (10.2)	46.65 (12.7)
Mean pain duration (months)	70	110	59.5	104.97
Employed (full or part time) (%)	28	27	27.7	36.3
Not working specifically due to pain (%)	44	34	52.4	31.8

PMP: pain management programme; SD: standard deviation.

and Medical Consultant in Pain and a team decision was made about suitability for PMP attendance. This is an observational and retrospective study.

Data collection

All patients on the PMP completed measures at baseline during an assessment session, which was their first appointment in the department, and were given the opportunity to consent to their scores being put on a Registry and used for research. Participation was voluntary and no incentive was provided. Between June 2014 and September 2017, there were 859 patients who completed a 16-day pain management programme at a tertiary-level pain clinic in the United Kingdom. For the purpose of this study, the patients were split into two groups: (1) litigation and (2) non-litigation identified by their own self-report at the time of assessment through a written tick box, although the duration of litigation, stage of claim and type of case were not recorded in this retrospective analysis. Patients were asked to provide information about the onset of their pain as well as employment status. If patients were not working, they were asked to note whether this was directly associated with their pain condition. Table 1 presents information regarding the average pain duration, age and gender split for each group, including comparison of those suitable and not suitable for a PMP. There were significant differences in the age of litigation versus non-litigation in the PMP-suitable sample, $t(857) = -2.39$, $p = 0.017$, and significant difference in the duration of pain, $t(857) = -5.16$, $p = 0.00$. Approximately 12.8% of the PMP-suitable sample reported having ongoing litigation at the time of assessment and the receipt of treatment compared with 10.7% of the complete sample at assessment clinic.

Missing data

A very small proportion of patients did not provide consent to have their data included in the Pain Registry (4% did not provide consent out of the sample of 2134

patients). The amount of missing data was low, primarily as the psychometrics and physical function measures form an integral part of the patient's clinical assessment. At initial assessment, 0.8% (24 patients) of the whole sample did not provide data on whether they had ongoing litigation. The dropout rates from the intervention were considered low (2%) due to the comprehensive initial assessment to identifying suitability for the PMP. The amount of missing data on all measures post-intervention was less than 1%.

Outcome measures

As a part of the assessment procedure, the patients are given a battery of psychological and physical measures to complete at two time points, at initial assessment and on the final day of the PMP. These measures included the following:

The Pain Intensity Numerical Scale is a 10-point Likert-type scale (0=no pain and 10=the most intense pain imaginable) measuring the intensity of pain experienced by a patient over the last week. Farrar et al.¹⁷ reported that the pain intensity scale was a reliable and valid measure of pain intensity.

The Beck Depression Inventory, 2nd Edition (BDI-II¹⁸) was used to assess symptoms of depression over the past 2 weeks. A total of 21 items are rated from 0 to 3. Total scores range from 0 to 63. Higher scores indicate greater depressive symptoms.

Pain self-efficacy was measured using the Pain Self-efficacy Questionnaire (PSEQ¹⁹) which assesses participants' confidence in performing activities (including household chores, socialising, work) while in pain, as well as respondents' beliefs about coping with pain without medication. A total of 10 items are rated from 0 (not at all confident) to 6 (completely confident) with total scores ranging from 0 to 60. Higher scores indicate greater pain self-efficacy.

The Pain Catastrophizing Scale (PCS²⁰) assessed catastrophic thoughts or feelings in relation to pain,

Table 2. Mean scores (standard deviations) for patients with and without litigation across psychological and physical domains of assessment.

Assessment domain	Between-subjects		Within-subjects			
	Baseline (T1) Litigation (N = 229)	Baseline (T1) Non-litigation (N = 1905)	PMP baseline (T1) Litigation (N = 110)	PMP baseline (T1) Non-litigation (N = 749)	Post-PMP (T2) Litigation (N = 110)	Post-PMP (T2) Non-litigation (N = 749)
Pain Intensity Numerical Rating Scale	7.05 (1.53)	7.49 (1.61)	7.71 (1.50)	7.38 (1.57)	6.83 (1.80)	6.33 (1.83)
Beck Depression Inventory	31.63 (11.22)	28.09 (12.24)	30.35 (9.59)	26.76 (11.28)	22.30 (11.07)	17.63 (11.60)
Pain Self-efficacy Questionnaire	14.30 (9.79)	17.55 (11.45)	14.37 (9.26)	18.51 (10.88)	27.90 (11.52)	32.39 (10.93)
Pain Catastrophizing Scale	33.01 (12.00)	30.64 (12.48)	31.05 (11.54)	28.90 (11.83)	22.22 (13.28)	18.33 (11.62)
5-Minute Walk	145.48 (113.43)	152.67 (114.88)	158.36 (111.36)	160.84 (116.42)	230.06 (132.91)	243.74 (129.56)
Chronic Pain Acceptance Questionnaire	39.61 (16.21)	43.92 (17.61)	39.88 (15.99)	45.08 (17.00)	57.86 (18.00)	63.68 (16.04)

Within-subjects is inclusive of only those patients deemed suitable for a pain management programme at Pain Clinic Assessment (T1).

including rumination about pain ('I can't stop thinking about how much this hurts'), magnification of pain ('I'm afraid that something serious might happen') and feeling helpless to manage pain ('there is nothing I can do to reduce the intensity of my pain'). A total of 13 items are rated on a 5-point scale ranging from 0 (not at all) to 4 (all the time). Total scores range from 0 to 52. Higher scores indicate greater catastrophic thinking.

The Chronic Pain Acceptance Questionnaire-Revised (CPAQ²¹) assessed acceptance of pain and distress. A total of 20 items are scored from 0 (never true) to 6 (always true). Higher scores indicate higher levels of acceptance. Total scores range from 0 to 120.

The 5-minute walk is an outcome measure administered by the physiotherapists. Harding and Williams²² reported this measure to be widely used as a part of physiotherapist assessments.

Patients were asked to complete a tick box comprising of yes or no in respect to whether they had any ongoing litigation process in relation to their pain conditions at that point in time. The average wait time until the commencement of treatment from assessment was 4 weeks.

Results

Table 2 presents data for the two groups at time 1 (pre-therapy) and 2 (post-therapy) (within-subjects). For

completeness, the data are also presented for all the patients at T1 which includes those who were not deemed suitable for inclusion on the PMP (between-subjects). The data were subjected to a mixed model multivariate analysis of covariance (MANCOVA) with group (litigation versus non-litigation) as a between-subjects variable; time (time 1 versus time 2) as a within-subjects variable; pain intensity, BDI, PSEQ, PCS, CPAQ and 5-minute walk scores as dependent variables; and age, gender and pain duration as covariates. Box's M test indicated that the covariance matrices were equal, there was no evidence of multicollinearity and scatter plots indicated that all univariate relationships were linear, suggesting that the analysis was valid. There were significant main effects for group ($F(6, 849) = 4.080$, $p < 0.0001$, partial eta square = 0.028) and time ($F(6, 849) = 18.357$, $p < 0.0001$, partial eta square = 0.115), but the group-time interaction was not significant ($F(6, 849) = 0.796$, $p = 0.573$, partial eta square = 0.006). Table 2 indicates that the litigation group scored significantly worse than the non-litigation group across the set of dependent variables and that both groups improved significantly over time; however, the difference between the groups did not vary at the two time points. In other words, treatment was equally effective for both groups when assessed on a linear combination of the outcome variables, although the litigation group was worse off overall.

Two further MANCOVAs were then run comparing the two groups at time 2 on primary physical (5-minute walk) and emotional outcomes (BDI score),

Table 3. Comparison of the number (%) of patients achieving clinically significant change within litigation and non-litigation groups with chi-square test for independence.

	Litigation (%)	Non-litigation (%)	Chi-square test for independence (Yate's correction for continuity)
Pain Intensity Numerical Rating Scale	30	36.1	$\chi^2 = 1.58$, $p = 0.21$ (n = 1028)
Beck Depression Inventory	60.3	60	$\chi^2 = 0.02$, $p = 0.89$ (n = 1024)
Pain Self-efficacy Questionnaire	73.4	76.8	$\chi^2 = 0.53$, $p = 0.47$ (n = 1033)
Pain Catastrophizing Scale	58.3	61.1	$\chi^2 = 0.27$, $p = 0.60$ (n = 1030)
5-Minute Walk	47	53.4	$\chi^2 = 1.63$, $p = 0.20$ (n = 956)
Chronic Pain Acceptance Questionnaire	80.2	76.4	$\chi^2 = 0.68$, $p = 0.41$ (n = 1020)

controlling for age, gender and pain duration as well as baseline differences on the corresponding measure. There was a significant between-group difference on time 2 BDI scores ($F(1, 889) = 5.398$, $p = 0.020$, partial eta square = 0.006) but not on time 2 five-minute walk ($F(1, 872) = 0.796$, $p = 0.060$, partial eta square = 0.004) when adjusting for covariates. Marginal means indicate that litigation was associated with poorer emotional outcomes post-PMP treatment than non-litigation even when controlling for baseline differences in depression; however, the magnitude of this effect was extremely small, amounting to less than 0.5% of the variation in depression outcomes. There was no effect of litigation on physical outcomes. These results were replicated in further analyses removing individual covariates, although the effect for depression increased marginally when baseline BDI scores were removed ($F(1, 896) = 10.756$, $p = 0.001$, partial eta square = 0.012).

Clinically significant change scores

The Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT)²³ have proposed standards for measuring *clinically significant* change in commonly used pain measures, across domains of functioning. For self-report instruments of physical and emotional functioning difference scores corresponding to 1 standard error of the mean (SEM), where SD is standard deviation within the sample and r is the internal reliability of the measure: $SD * \sqrt{(1-r)}$. Table 3 lists the percentage of patients within each group that achieved clinically significant change in the psychological or physical domain assessed post-intervention. Table 3 further reports chi-square analyses (test for independence) comparing litigation versus non-litigation groups for all outcome domains. Chi-square analyses did not identify any significant difference between the groups. Clinically significant change on the BDI-II was considered a reduction of 4.8 points, pain intensity a reduction of 2 points on the visual analogue scale (VAS), a PCS reduction of 6.4 points or

more, an improvement of 7.3 points or more on CPAQ, an improvement of 26 m or more in walking distance within 5 minutes and an improvement of 3 or more points on the PSEQ.

Discussion

Overall, this study presents data that suggest that the context of litigation alone should not be a sole reasoning for delay or exclusion of individuals from multidisciplinary self-management treatments for chronic pain. Specifically, the assumption that positive change in functional and psychological outcomes is unlikely due to potential secondary financial gain in the litigation process is not convincingly supported by the data in the current observational study. These findings are supportive of Spearing et al.'s¹² systematic review in whiplash injury compensation cases who found no clear evidence to uphold the notion that the context of compensation *alone* necessarily produces worse health outcomes. These results are also supportive of a smaller study by Dworkin et al.⁶ who found litigation to be an unsubstantiated rationale for the exclusion of patients from treatment programmes.

The data indicate that the litigation sample differed from the non-litigation sample in several ways at initial assessment. Specifically, in respect to gender ratio, age and pain duration, which appear to be reflective of the findings in previous studies, the litigation group appears to be slightly younger, more likely to be male than a non-litigation sample, with a shorter duration of pain. The latter findings are comparable to data presented by Dworkin et al.⁶ who described a litigation sample with a split of 41:59 (males:females) and a non-litigation sample 38:62. Blyth et al.¹³ also describe a sample of litigants with pain as more likely to be younger and male when compared with non-litigants. Moreover, Suter¹⁴ describes a litigant sample as notably younger than the non-litigant sample.

The results show that those patients with ongoing litigation were significantly worse across all psychological and physical domains than those without the

context of litigation, at initial assessment. The latter finding appears to be present irrespective of whether the patient was deemed suitable for the PMP intervention. There are a number of possible explanations for this finding including the potential distress caused by the litigation process. Moreover, the patients within the litigation sample continued to report higher levels of distress and lower levels of physical functioning post-PMP when compared with the non-litigation sample. However, an interesting finding is that the amount of change achieved from participation in the PMP remained comparable across the two groups, with no statistical significant differences between the percentages of change between the groups. In other words, there was no clear evidence for a difference in ability to make positive recovery in the context of appropriate intervention regardless of the context of litigation in this sample. Although the sample size was larger for those in the non-litigation group, there appears to be a greater proportion of patients who are unemployed in the litigation sample, with a greater proportion citing the reason for unemployment being directly related to chronic pain. This outcome is supportive of the findings that previous inconsistencies in treatment responses in litigation samples may in fact be most notably related to employment status.⁶ It is possible that increased likelihood of unemployment, due to pain, will account for the very small effect of litigation (0.5%) on post-PMP depression.²⁴ The aims and focus of this article did not encompass a deeper analysis of employment outcomes, although the authors acknowledge that this requires further investigation.

Implications

These findings provide some much needed preliminary information to inform clinical decision-making around treatment options and timing when an individual with chronic pain has ongoing litigation and is under the care of pain services. The authors suggest that it is unhelpful to exclude or defer patients from commencement of PMPs based *solely* on the presence of litigation, although future research may wish to investigate the relevance of the stage of the claim. It may also be that factors surrounding loss of employment and vocational opportunities are factors of greater significance in this group (litigation) of patients, although further investigation is required.

Limitations

The authors acknowledge that some bias may have occurred as the litigation status of patients for which PMP treatment was deemed unsuitable was not assessed. We cannot exclude the possibility that

patients in litigation are more often discharged as unsuitable after assessment than patients not in litigation. Similarly, it is obvious that the filter of pre-assessment does not allow the assessment of outcomes from the whole litigation group. However encouragingly, since every patient referred to multi-disciplinary PMP will have to undergo such initial assessment, our outcomes reflect the pragmatic context of a relevant group of those who pass the assessment. The sample in this retrospective and observational study may indeed be biased.

The results reflect the progress only of those patients who were deemed appropriate for attendance on a pain management programme and as such do not reflect the trajectory of health outcomes for those with ongoing litigation who do not participate in treatment or would not be deemed suitable. Moreover, this study was observational and as such no data were gathered about the specifics of the claims of the individuals and whether these related to personal injury or medical negligence claims. Further study should explore whether there are any relationships between the types of cases and duration of the litigation in relation to treatment outcomes for PMPs.

Conclusion

This article proposes that it is not appropriate to assume that the context of litigation inevitably means limited scope for positive psychological and functional physical outcomes in individuals with chronic pain presentations. It appears that similar to previous studies, patients with litigation report a shorter duration of pain from onset and are on average younger. They are also more likely to be male when compared with a broader chronic pain population without litigation. Other factors appear significant in understanding positive change in individuals deemed suitable for PMP treatment. The authors suggest more distressed patients may seek out legal proceedings or those who have lost employment due to the nature of the claim (e.g. a workplace injury). These results are limited to individuals who were able both physically and psychologically to attend a PMP as assessed by detailed multi-disciplinary assessment and can therefore be unlikely extrapolated to all individuals involved in litigation with chronic pain. However, analysis showed no statistically significant differences between the baseline scores of those in either group (litigation versus non-litigation) and whether when they were deemed suitable or not suitable for PMP.

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Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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H.T., R.B. and H.W. contributed equally to this study.

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Trial registration

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References

1. The British Pain Society. Guidelines for pain management programmes for adults: an evidence-based review. *Resource Document*, 2013, www.britishpainsociety.org
2. Hoffman BM, Papas RK, Chatkoff DK, et al. Meta-analysis of psychological interventions for chronic low back pain. *Health Psychol* 2007; 26(1): 1–9.
3. de C, Williams A, Eccleston C, et al. Psychological therapy for adults with longstanding distressing pain and disability. *Cochrane Database Syst Rev*, 2012, https://www.cochrane.org/CD007407/SYMPT_psychological-therapy-adults-longstanding-distressing-pain-and-disability
4. Roberts AH and Reinhardt L. The behavioral management of chronic pain: long-term follow-up with comparison groups. *Pain* 1980; 8(2): 151–162.
5. Jacobs MS. Psychological factors influencing chronic pain and the impact of litigation. *Curr Phys Med Rehab Rep* 2013; 1(2): 135–141.
6. Dworkin RH, Handlin DS, Richlin DM, et al. Unraveling the effects of compensation, litigation, and employment on treatment response in chronic pain. *Pain* 1985; 23(1): 49–59.
7. Greve KW, Ord JS, Bianchini KJ, et al. Prevalence of malingering in patients with chronic pain referred for psychologic evaluation in a medico-legal context. *Arch Phys Med Rehab* 2009; 90(7): 1117–1126.
8. Weighill VE and Buglass D. An updated review of compensation neurosis. *Pain Manag* 1989; 2: 100–105.
9. Harris I, Mulford J, Solomon M, et al. Association between compensation status and outcome after surgery: a meta-analysis. *JAMA* 2005; 293(13): 1644–1652.
10. Tait RC, Chibnall JT and Richardson WD. Litigation and employment status: effects on patients with chronic pain. *Pain* 1990; 43(1): 37–46.
11. King SA and Snow BR. Factors for predicting premature termination from a multidisciplinary inpatient chronic pain program. *Pain* 1989; 39(3): 281–287.
12. Spearing NM, Connelly LB and Sterling M. Does injury compensation lead to worse health after whiplash? A systematic review. *Pain* 2012; 153(6): 1274–1282.
13. Blyth FM, March LM, Nicholas MK, et al. Chronic pain, work performance and litigation. *Pain* 2003; 103(1–2): 41–47.
14. Suter PB. Employment and litigation: improved by work, assisted by verdict. *Pain* 2012; 100(3): 249–257.
15. Spearing NM and Connelly LB. Whiplash and the compensation hypothesis. *Spine* 2011; 36(1): 303–308.
16. Robinson R, Kerley E, Garofalo J, et al. Pain and illness behavior: impact of litigation status on interdisciplinary care of chronic pain. *J Pain* 2004; 15(3): S101.
17. Farrar JT, Young JP Jr, Werth JL, et al. Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. *Pain* 2001; 94(2): 149–158.
18. Beck AT, Steer RA and Brown G. *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation, 1996.
19. Nicholas SK. Self-efficacy and chronic pain. *Paper presented at the annual conference of the British Psychological Society*, St Andrews, 1989.
20. Sullivan MJL, Bishop SR and Pivik J. The Pain Catastrophizing Scale: development and validation. *Psychol Assess* 1995; 7(1): 524–532.
21. McCracken LM, Vowles KE and Eccleston C. Acceptance of chronic pain: component analysis and a revised assessment method. *Pain* 2004; 107(1): 159–166.
22. Harding V and de C Williams AC. Extending physiotherapy skills using a psychological approach: cognitive-behavioural management of chronic pain. *Physiotherapy* 1995; 81(11): 681–688.
23. Dworkin RH, Turk DC, Farrar JT, et al. Core outcome measures for chronic pain clinical trials: IMMPACT recommendations. *Pain* 2005; 113(1): 9–19.
24. Chin WS, Shiao JSC, Liao SC, et al. Depressive, anxiety and post-traumatic stress disorders at six years after occupational injuries. *Eur Arch Psych Clin Neurosci* 2017; 267(6): 507–516.