

# Estimation of Prognosis in Non Specific Low Back Pain from Biopsychosocial Perspectives

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## 1. Introduction

The significance of low back pain and associated disability across many western nations continues to be an important issue. Pain and disability associated with musculoskeletal conditions represents a significant health and economic burden in Australia, with total direct and indirect costs of musculoskeletal disorders including arthritis being in excess of 15 billion dollars per annum (AAMPG. 2003).

In the USA the data from the 1998 Medical Expenditure Panel Survey, reported that health care expenditure incurred by individuals with back pain reached in excess of 90 billion dollars. Individuals with back pain also incurred 60% more health care costs than those without (Luo, Pietrobon et al. 2003).

There is also a growing literature that supports the contention that low back pain is a complex, multidimensional health issue and should be reviewed within the context of the individual (Young, Waisiak, et al 2011).

Evidence-based clinical practice guidelines, such as those produced in Australia in 2003 emphasise the importance of the biopsychosocial model in the understanding of pain in general and musculoskeletal pain in particular (AAMPG. 2003). The biopsychosocial model focuses on illness, communicating or behaving in a manner that suggests the individual is not well, rather than on disease, the person's experience of illness being influenced by physical, psychological and social factors (Engel. 1980). Engel's model highlighted that in order to respond adequately to an individuals suffering, and give them a sense of being understood, the clinician needed to be able to respond simultaneously to the biological, psychological and social dimensions of illness (Borrell-Carrio, Suchman et al 2004)

The model incorporates the biomedical understanding of nociception as part of the wider holistic biopsychosocial view, rather than treating psychosocial factors as an 'overlay' to the biomedical model.

Philosophically the model is a way of understanding how suffering, disease and illness may be affected by multiple levels of organisation, from the molecular to societal. Practically, the model provides a way of understanding the patient's subjective experience as an essential contributor to accurate clinical diagnosis and assessment (Borrell-Carrio et al 2004).

There has been increasing acceptance that psychosocial factors play a significant role in the transition from an acute episode, or episodes, of low back pain to a chronic disorder (Pincus, Burton, et al. 2002). There is also some evidence that these factors may play an aetiological role (Pincus et al. 2002) (Linton. 2000) (Trouchon, and Fillion. L.2000).

The acceptance of the wider biopsychosocial model has been further extended by the World Health Organisation's (WHO) International Classification of Functioning, Disability and Health (ICF) (WHO. 2000).

Many individual psychological factors have been reported over the years as potential obstacles to recovery, with much of the early work centred around fear. Initially the work focussed around the fear avoidance model of exaggerated pain perception in chronic low back developed by Lethem and co-workers (Lethem, Slade, Troup, Bentley. 1983). The Fear-Avoidance Belief Questionnaire developed by Waddell and co-workers published in 1993 measured beliefs about physical activity and work (Waddell, Somerville, Henderson, Newton, Main 1993). Workers with low back pain were shown to believe that physical activity including work was feared to increase both spinal pain and damage. These fear avoidant beliefs helped to explain self reported disability in normal daily activities including work (Waddell et al 1993).

Fear of pain together with fear of hurt or harm were further postulated as a fundamental mechanism of disability associated with low back pain were explored by Vlaeyen and Linton. The natural human reaction to pain is an automatic one to try and avoid what is believed to be the cause of the pain, ongoing fear then potentially drives further avoidant behavior (Vlaeyen and Linton 2000).

Contrary to the weight of evidence however, surveys of primary contact practitioners continue to indicate that general practitioners for instance, may only be partially managing low back pain from this evidence-based perspective. This may be due in part to the difficulties reported in changing physician behaviour (Buchbinder, Staples et al. 2009) and then further highlighted by the difficulty reported in integrating the biopsychosocial model into clinical disciplines, such as physiotherapy (Harland and Lavallee. 2003). The potential difficulties in fully incorporating a biopsychosocial approach to patients, appear to transcend professional training and boundaries, as Harding and co-workers reported in 2010. Whilst pain clinic practitioners in the UK embrace behavioural based management as part of a biopsychosocial pain management model, little consideration was given to social factors (Harding, Campbell et al 2010).

The estimation of prognosis (identifying those at risk of a poor outcome such as ongoing pain or disability, or failing to return to work) of an episode of low back pain is particularly important to clinicians, patients, employers and third party payers alike. However despite the weight of evidence there remains a tendency to rely on instruments that quantify prognostic factors from a biomedical perspective alone, rather than the contemporary biopsychosocial model, whilst focusing on return to work as a single outcome. A predictive instrument that may help clinicians fully incorporate the biopsychosocial model into clinical practice clearly has some utility, and whilst it has been suggested that such an instrument needs to capture all the potential biopsychosocial risk factors that may adversely affect functional outcomes (Hilficker, Bachmann, et al. 2007), an initial attempt to produce such a draft questionnaire resulted in a long and unwieldy instrument

The study reported in this chapter tested the hypothesis that it would be feasible to develop a valid and reliable instrument for estimating the prognosis of non specific low back pain from within the biopsychosocial domain, suitable for routine clinical use.

Ethical approval for each step of the instrument's development was obtained from the ethics committee, University of Queensland, Australia.

The components of the resultant instrument (termed the Biopsychosocial Index of Prognosis (BPIP)) were developed from the literature review and perspective of a logical course of clinical enquiry into the current and past episodes of low back pain. The nature and character of the pain together with the severity, spread and duration of the symptoms were also included in the draft questionnaire. Past and present medical and psychological histories were considered together with demographic details including occupation. The items generated were combined into a content map derived from the International Classification of Function (ICF). Initial item generation included items from previously validated instruments identified from the literature where possible. The draft index initially contained 145 items. The large pool of items were initially included in the prototype questionnaire, which was progressively and systematically subjected to item reduction. The necessity for this process of item reduction was established a priori, and driven by the lack of feasibility of carrying a large number of potentially redundant items through to the validation stage of the instruments development (Bellamy, Campbell et al. 2002). The development of the BPIP potentially filled a gap in measurement, estimating prognosis from a variety of biopsychosocial domains and driven by clinical, rather than theoretical perspectives.

This chapter describes the development of the BPIP including the steps taken in item reduction and reports on testing the validity of the final instrument, and its reliability against the 'gold standard' measure identified as the Roland and Morris disability questionnaire (RDQ) (Roland and Morris. 1983). The RDQ is one of the most frequently reported instruments used to assess the disability associated with low back pain. The RDQ was also the criterion measure selected for the previous work of Burton and co-workers on psychosocial predictors (Burton, Tillotson, Main and Hollis 1995). A variety of other instruments were considered from the literature including the Orebro Musculoskeletal Pain Questionnaire (Linton and Hallden. 1998) as the potential gold standard. However the focus was on the wider community with low back pain, not just workers with acute low back pain, so the RDQ remained the instrument of choice.

## **2. Methods**

### **2.1 Development of the BPIP**

The initial assessments of the prototype index were undertaken in three distinct phases. In phase one, piloting was undertaken with a small group without low back pain, consisting of five health care professionals from a variety of disciplines and from different English speaking countries including England, Australia and New Zealand. and chosen for their academic and general life experience. The primary focus of the first pilot trial was to obtain feedback on the pool of items selected for evidence of any ambiguity or repetition, ease of administration and the overall comprehensiveness of the questionnaire.

In phase two, a further pilot study was undertaken with a group of low back pain patients recruited from a variety of primary health care practices on the Sunshine Coast in Australia. Patients were provided with a pack containing the prototype questionnaire, and instruction sheet and two copies of the informed consent form together with two stamped addressed envelopes. Each stage of data collection was subjected to ethical clearance through The University of Queensland's ethics committee.

Phase three was a 24 hour test-retest of the reliability of the amended instrument was completed. BPIP packs containing 2 identical questionnaires were distributed with the instruction to complete the first questionnaire and then the second one, ideally at the same time of day, 24 hours later without reference to the answers provided the day before. The intention was to establish reliability in a sample of 25% of the total of respondents required for the trial of the main instrument.

No specific exclusion criteria were stated other than children or adolescents, pregnancy or three months post partum. The instrument was designed for use in adults over the age of 18 years with English as a first language.

The overall development process of the BPIP is summarised in Figure 1

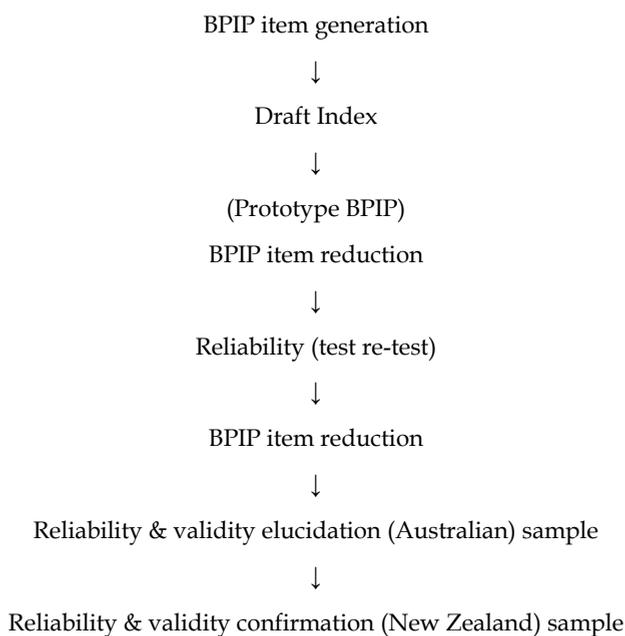


Fig. 1.

A total of one hundred and forty five items were generated from the literature review and clinical perspectives for the draft questionnaire. Redundant and non response items were eliminated following consultation with a panel of five independent healthcare practitioners as the first stage of item reduction. The questionnaire was subsequently reduced to a ninety nine item prototype.

A 24 hour test-retest of the stability of the ninety-nine item questionnaire was undertaken by twenty five respondents who were asked to complete the first questionnaire (A) and then the second (B) at the same time twenty four hours later, without referring back to their previous answers.

## 2.2 Data collection

Questionnaire packs containing the prototype BPIP, RDQ, an informed consent form and instruction sheet were assembled. The data captured at baseline and twelve weeks, outcomes at twelve weeks having been previously reported as being predictive of outcome at one year and beyond (Burton, McClune, et al .2004)

Recruitment of respondents originally intended to capture a homogeneous cohort drawn from general practice proved impossible despite repeated requests via the faculty of Health Sciences, University of Queensland. Recruitment difficulties therefore resulted in two distinct cohorts, a larger Australian cohort ( $n = 91$ ) recruited from an osteopathic practice and a diagnostic imaging centre. The smaller New Zealand cohort ( $n = 27$ ) was recruited from an osteopathic practice and an osteopathic teaching clinic.

The larger Australian group was utilised as an elucidation (or clarification) cohort, and the smaller New Zealand cohort was treated as a small prospective validation of the final version of the BPIP.

## 2.3 Statistical analysis

The continued process of item reduction, including correlation analysis of baseline BPIP data with the 12 week score on the RDQ resulted in an ordinal scale of initially 24 items, which was further reduced to 12 items for correlation with the RDQ. The BPIP was tested for internal consistency in both the Australian and New Zealand cohorts.

The baseline data from the Australian cohort were assessed for concurrent, predictive and construct validity against the RDQ.

Reliability of the index was evaluated by calculation of Cronbach's Alpha of the baseline BPIP score with the twelve week score on the RDQ in the both cohorts. The mean scores fell within the range of possible scores indicating that the scores were entered into the data set correctly.

The BPIP baseline data from the New Zealand cohort was treated as a small prospective validation of the BPIP scale, with the baseline data from the BPIP correlated with the change score from the baseline to twelve weeks of the RDQ.

The questions retained their original numbers from the draft questionnaire until item reduction was completed, and were then renumbered 1-12 in the final BPIP scale.

Analysis was undertaken using the Statistical Package for Social Sciences (SPSS).

## 3. Results

The results are reported in the same order as they contributed to the item reduction process, and final assessment of the 12 item BPIP

### 3.1 Test-re-test of the ninety nine item prototype BPIP

A positive correlation between A and B questionnaires was demonstrated in a one tailed test,  $df\ 11-2 = 9$ . The Pearson product moment correlation coefficient was calculated in Excel: Pearson  $r = 0.98$ ,  $P < 0.0005$ .

The calculation of  $R^2\ 0.98 \times 0.98 = 0.96$ , demonstrated that 96% of the shared variance between the two test samples was accounted for by the result.

One hundred and eighteen respondents completed the twelve week data collection period. This was comprised of 91 in the Australian cohort and 27 in New Zealand.

The demographics including gender and age, and the percentage make up of the two cohorts are contained in Tables 1 and 2. Table 3 reports on the duration of low back pain measured at baseline in both cohorts.

	Gender	
	Australian	New Zealand
Male	Aus: 26 (29%)	NZ: 6 (22%)
Female	Aus: 65 (71%)	NZ: 21 (78%)

Table 1.

	Age Range	
	Australian	New Zealand
20-29	6 (7%)	3 (11%)
30-39	13 (14%)	6 (22%)
40-49	16 (18%)	5 (19%)
50-59	30 (33%)	7 (26%)
60 +	26 (29%)	6 (22%)

Table 2.

Australian Cohort Duration of LBP at Baseline					
Weeks duration	0-2 weeks	3-5 weeks	6-8 weeks	9-11 weeks	12 weeks +
Totals	20	15	5	1	50
Percentage	21.9%	16.4%	5.4%	1.0%	54.9%

Table 3.

New Zealand Cohort Duration of LBP at Baseline					
Weeks duration	0-2 weeks	3-5 weeks	6-8 weeks	9-11 weeks	12 weeks +
Totals	13	5	2	0	7
Percentage	48.1%	18.5%	7.4%	0.0%	25.9%

Table 4.

### 3.2 Item reduction and reliability

Correlation analysis (used to describe the strength and direction of the linear relationship between the two variables) of the baseline BPIP Australian data with the twelve week RDQ Australian data resulted in reducing the prototype scale to questions which correlated at or above 0.3. Items which correlated below 0.3 were considered too weak for inclusion, and a total of twenty four questions were retained for further analysis.

Reliability coefficients for internal consistency of the twenty four item BPIP scale were as follows:

The Australian cohort, Cronbach's Alpha = 0.8736.

The New Zealand cohort, Cronbach's Alpha = 0.8628.

A further review of the correlation analysis of the baseline BPIP Australian data with twelve week RDQ Australian data for items that correlated at or above 0.4 resulted in further item reduction of the BPIP to twelve questions. Following this further item reduction, reliability coefficients for internal consistency were calculated and are included in Tables 5 and 6.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
severity	29.97	89.921	.557	.867
Workintrude	30.66	85.438	.741	.857
Socintrude	30.58	81.670	.728	.854
q19	30.50	82.527	.634	.860
q24	29.95	83.289	.606	.862
q25	30.36	80.859	.687	.857
q26	29.86	91.889	.282	.882
Worklimit	30.25	87.524	.553	.866
soclimit	30.21	88.238	.526	.867
q69	30.61	88.213	.517	.868
q73	30.32	84.827	.546	.866
q74	30.84	85.945	.489	.870

Table 5. Inter-item Statistics Baseline BPIP/12 week RDQ; Australian cohort

The Australian cohort, Cronbach's Alpha = 0.875.

The New Zealand cohort, Cronbach's Alpha = 0.776.

Once it was established that the reduced scale reliably measured the underlying construct, regression analysis was undertaken to establish levels of statistical significance.

Regression analysis of the Australian cohort based on the twelve item scale demonstrated that 61.7% of the variance in the RDQ score at twelve weeks was accounted for by the BPIP scale, with  $p = 0.0005$ .

	Mean	Std. Deviation	N
RDQchange 13	6.4074	7.05069	27
severity	3.59	.970	27
WorkIntrude	3.15	1.199	27
SocIntrude	2.70	1.235	27
q19	2.52	1.553	27
q24	3.30	1.235	27
q25	2.52	1.503	27
q26	3.44	1.502	27
WorkLimit	2.81	.879	27
SOCLIMIT	2.78	.801	27
Q69	3.11	1.311	27
Q73	1.96	1.192	27
Q74	1.70	1.137	27

Table 6. Inter-Item statistics Baseline BPIP/12 week RDQ; New Zealand cohort

Regression analysis of the change score of the RDQ with the twelve item BPIP in the New Zealand cohort demonstrated that 78.2% of the variance in RDQ scores was accounted for by the BPIP scale, with  $p = 0.006$ .

### 3.3 Multiple regression analysis (Australian cohort)

Standard multiple regression analysis was undertaken as it allows for a more sophisticated examination of the relationship between the dependent and independent variables, in this case how well the BPIP was able to predict outcome of the RDQ.

	Mean	Std. Deviation	N
RDQ12wk aus	5.5843	5.26741	89
severity	3.13	.964	91
WorkIntrude	2.44	1.056	91
SocIntrude	2.52	1.336	91
q19	2.60	1.429	91
q24	3.15	1.421	91
q25	2.74	1.459	91
q26	3.24	1.353	91
WorkLimit	2.85	1.173	91
soclimit	2.89	1.159	91
q69	2.49	1.177	91
q73	2.78	1.413	91
q74	2.26	1.436	91

Table 7. Multiple Regression; Australian cohort: Baseline 12 Item BPIP/12 wk RDQ.

Multiple regression analysis was then performed on the Australian cohort to establish the predictive value of the shortened BPIP scale score at baseline for the 12 week RDQ.

The results of the analysis of the Australian cohort are presented in Table 7, Table 8 contains the ANOVA result which demonstrates levels of significance.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1505.555	12	125.463	10.186	.000 a
	Residual	936.063	76	12.317		
	Total	2441.618	88			

a. Predictors: (Constant), q74, q26, q69, severity, soclimit, q73, q24, q19, SocIntrude,q25, WorkIntrude, WorkLimit

b. Dependent Variable: RDQ12wk aus

Table 8.

The variance in the RDQ score (61.7%) at 12 weeks was accounted for by the 12 item BPIP. The null hypothesis that multiple R in this population equals zero was also confirmed by significance in the ANOVA  $p = 0.0005$ . Multiple R is a measure of how strongly or weakly the criterion variables (BPIP variables) are related to the dependant variable (RDQ)(Stalin. 2003).

### 3.4 Regression analysis, (New Zealand cohort)

Regression analysis of the 12 item BPIP with the RDQ change scores baseline to 12 weeks was then performed on the New Zealand cohort, as part of the prospective validation of the

	Mean	Std. Deviation	N
RDQchange 13	6.4074	7.05069	27
severity	3.59	.970	27
WorkIntrude	3.15	1.199	27
SocIntrude	2.70	1.235	27
q19	2.52	1.553	27
q24	3.30	1.235	27
q25	2.52	1.503	27
q26	3.44	1.502	27
WorkLimit	2.81	.879	27
SOCLIMIT	2.78	.801	27
Q69	3.11	1.311	27
Q73	1.96	1.192	27
Q74	1.70	1.137	27

Table 9. Multiple Regression of 12 Item BPIP scores with the change score Roland Morris Disability Index, baseline to 12 weeks; New Zealand Cohort

BPIP following the statistical analysis of the Australian data. The change score from baseline to 12 weeks was utilised as the raw baseline to 12 week score in the New Zealand cohort and did not reach statistical significance. The results are summarised in the same order as the Australian results in Tables 9 and 10.

The variance in the change score from baseline to 12 weeks of the Roland Morris Disability Index (78.2%) was accounted for by the 12 item BPIP.

The null hypothesis that multiple R in this New Zealand population equals zero was also confirmed by significance in the ANOVA  $p = 0.006$

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1011.152	12	84.263	4.193	.006 a
	Residual	281.367	14	20.098		
	Total	1292.519	26			

a. Predictors: (Constant), Q74, Q69, WorkLimit, q24, SocIntrude, q26, severity, SOCLIMIT, Q73, q19, WorkIntrude, q25

b. Dependent Variable: RDQchange 13

Table 10.

#### 4. Discussion

The development of the BPIP from the original hypothesis, that it was feasible to develop a biopsychosocial prognostic instrument for eventual use in clinical practice, produced a promising result. The utility of the scale may also enable clinicians to consider the possibility that a slow or poor prognosis may be the result of a number of psychosocial obstacles to recovery being present, rather than assuming that underlying pathophysiological constraints to recovery are the culprits.

The study built on the seminal study of Burton and co-workers (Burton, Tillotson et al. 1993) which utilised a small number of items from previously validated measures to correlate with the RDQ, to positively demonstrate that psychosocial factors were indeed predictive of outcome. Other biopsychosocial instruments tend to focus on single psychosocial predictors (Hurley, Dusoier. et al 2000) or are designed as screening instruments for identifying those specifically at risk of developing long term incapacity from work such as the Orebro questionnaire (Linton and Hallden. 1997). These instruments also differ from the BPIP in that they primarily focus on screening workers with acute low back pain, rather than the wider patient population often consulted in primary care.

The BPIP was developed from clinical perspectives rather than isolating a single construct such as fear avoidance as a predictive factor of disability. The BPIP's focus is consistent with the current idea of low back pain as a fluctuating and disabling condition (Young, Wasiak,

Phillips and Gross. 2011) that needs to be considered within the context of the individuals experience. Recent studies suggest that perceptions of personal control, pain self efficacy, the acute/chronic timeline and illness identity are distinctive psychological obstacles to recovery in primary care patients with low back pain, with depression, catastrophising and fear avoidance being reported as less significant (Foster, Thomas, Bishop, Dunn and Main. 2011). These findings being broadly consistent with the content of the BPIP.

The approach to data collection was to keep exclusion criteria to a minimum and not discriminate against respondents from the arbitrary time dependent classification of 12 weeks between acute and chronic low back pain patients.

#### 4.1 Summary of key findings

A logical sequence of item reduction resulted in the 24 item BPIP scale, which was assessed both for its validity and reliability in separate cohorts, with a similar and strong result in both cases, with alpha value above 0.85.

The Pearson product moment correlation of the total score of the 24 item BPIP scale at baseline with the 12 week RDQ score demonstrated that the New Zealand scores did not reach statistical levels of significance. The small numbers in the cohort ( $n = 27$ ) or the more acute nature of the respondents, (21.9% reported pain of more than twelve weeks duration) may have potentially impacted on the result. However as the two cohorts tested differently, the decision to deal with the two groups as separate cohorts appears to have been justified.

The BPIP was shortened to 12 items following further correlation analysis of the Australian cohort's BPIP scores and questions demonstrating the stronger correlation of 0.4 were retained, reducing the scale to a single sheet of A4 paper, potentially improving the scales clinical utility.

To check that the reduced scale could still be considered reliable, reliability analysis using Cronbach's alpha was again undertaken in the Australian cohort. There was no appreciable difference in the reliability of the 24-item scale over the much shorter 12-item scale.

There was a small decrease in Cronbach's alpha score in the 12 item BPIP in the New Zealand cohort of 0.09 over the 24 item scale although the scale can still be considered as reliable. The correlation analysis of the items was combined with all the other steps of item reduction, to produce the definitive BPIP scale, which proved to be statistically reliable.

The results demonstrate that a high proportion of the variance in the RDQ score at 12 weeks was accounted for by the 12 item BPIP, and statistically significant. The retained questions appear at the end the chapter. The BPIP question which made the strongest unique contribution to the dependent variable was; 'The pain makes me feel that I can't go on with my normal activities'. The individual's perception of their low back pain being the greatest single contributor to their level of functioning, as measured by the RDQ, and interference with work and between episode limitations at work were the next two strongest single contributors.

Interference with work was the strongest single contributor to predicting the dependent variable, which may be expected when the more acute nature of the New Zealand cohort's low back pain is taken into account. Interestingly the next strongest contributor to the prediction of the dependent variable in the New Zealand cohort was the statement that; 'My

low back pain is dominating my life', with the statement: 'I have no hope of ever getting back to normal activities' the next strongest predictor. Despite the New Zealand group being a more acute group by duration of low back pain reported at baseline, these perceptions, and mal-adaptive cognitions about the low back pain appear to be evident. This suggests that early on in the duration of an episode of low back pain, perception and mal-adaptive cognitions may well play a part in influencing prognosis, and can be readily quantified by the BPIP.

#### 4.2 Comparison with other studies

The variance in RDQ scores was accounted for by the 12 item BPIP in the New Zealand cohort, (78.2%) which was considerably higher than the result of Burton and co-workers (Burton et al. 1995). This is potentially a reflection on the wider biopsychosocial domains of the BPIP capturing a greater range of influences on function when correlated against the RDQ. The result was also statistically significant.

The variance in RDQ score accounted for by the BPIP is similarly higher than that reported by Foster and co-workers in 2010. The prospective cohort study of Foster and co-workers of 3019 adults in the UK assessed distinctiveness of psychosocial obstacles to recovery and their multivariate model accounted for 47.7% in variance of RDQ score at 6 months.

A poor perception of outcome, high disability levels, and high self rated pain intensity were also identified as indicators of a poor prognosis in a large inception cohort study reported by Costa and co-workers (Costa, Maher et al.2009). The large cohort demonstrated more than 50% of respondents had not recovered fully from pain or disability after 12 months and highlighted the desirability of an early biopsychosocial estimation of prognosis to inform patient management.

The size of the cohort compared favourably with other predictive instrument studies reported in the literature such as Hurley and co-workers ( $n=118$ ) (Hurley, Dusoir et al 2001) and Stratford and co-workers ( $n=88$ ) (Stratford, Binkley et al. 1996).

#### 4.3 Limitations

The biopsychosocial model itself is used in a variety of ways within the literature, with any number of interchangeable variables being included from time to time. This makes a definitive statement about the model and which variables to include for statistical analysis somewhat difficult.

There is also some debate about the relative weight that should be attributed to the biomedical or psychosocial dimensions and whether the literature has become too focused on individual aspects of the model, rather than the overall inclusive biopsychosocial concept. However the literature continues to reflect the need for clinicians to be able to consider their patients from a biopsychosocial perspective in order to inform both prognosis and target interventions.

Self-report and perception of the patient's condition has also been identified as being vulnerable to the individual's social experience (Sen.2002).

The sample size also potentially limits the generalisability of the results.



- Q5. Everything I do I consider how it will affect my low back pain 1 2 3 4 5
- Q6. My low back pain is dominating my life 1 2 3 4 5
- Q7. My low back pain disturbs my sleep 1 2 3 4 5
- Q8. The pain makes me feel that I can't go on with my normal activities 1 2 3 4 5
- Q9. I believe I will get back to my normal level of activities 1 2 3 4 5
- Q10. I have no hope of ever getting back to normal activities 1 2 3 4 5
- Q11. In between episodes does your back limit what you can do at work?

*Please circle one response*

- Q12. In between episodes does your back limit what you can do socially (inc sport)?

*Please circle one response*

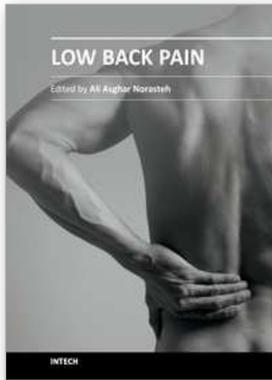
Not at all: Occasionally: Often: All the time

## 7. References

- Australian Acute Musculoskeletal Pain Guidelines Group. (AAMPG) Evidenced-Based Management of Acute Musculoskeletal Pain. 2003. Australian Academic Press. Brisbane
- Bellamy, N., Campbell, J., Haraouit, B., Buchbinder, R., Hobby, K., Roth, J.H., and MacDermid, J.C. Dimensionality and clinical importance of pain and disability in hand osteoarthritis: Development of the Australian/Canadian (AUSCAN) osteoarthritis hand index. *Osteoarthritis and Cartilage*. 2002.10:855-862
- Borrell-Carrio, F., Suchman, A.L., Epstien, R.M. The Biopsychosocial model 25 years later:principals, practice and scientific enquiry. *Annals of family medicine*. 2004.2:6:576-582.
- Buchbinder, R., Staples, M., and Jolley, D. Doctors with a special interest in back pain have poorer knowledge about how to treat back pain. *Spine*. 2009. 34:11:1218-1226.
- Burton, A.K., Tillotson, K.M., Main, C. J., and Hollis, S. Psychosocial predictors of outcome in acute and subchronic low back trouble. *Spine*.1995. 20:6: 722-728.
- Burton, A.K., McClune, T.D., Clark, R.D., and Main C.J. Long term follow-up of patients with low back pain attending for manipulative care: outcomes and predictors. *Manual Therapy*. 2004.9:30-35
- Costa, L, C. ,Menezes.Maher, C.G., McAuley, J.H., Hancock, M.J., Herbert, R.D., Refshauge, K.M., and Henschke, N. Prognosis for patients with chronic low back pain: inception cohort trial. *BMJ*. 2009 doi:10.1136/bmj/b3829
- Engel, G.L. The clinical application of the Biopsychosocial model. *American Journal of Psychiatry*.1980. 137:5: 535-44.
- Foster, N.E., Thomas, E., Bishop, A., Dunn, K.M., Main, C.J. Distictiveness of psychological obstacles to recovery in low back pain patients in primary care .*Pain*.2010.148:398-406
- Harding, G., Campbell, J., Parsons, S., Rachman, A., Underwood, M. British pain clinic practitioners' recognition and use of the biopsychosocial pain management model

- for patients when physical interventions and ineffective or inappropriate. BMC musculoskeletal disorders doi:1471-2474/11/51.
- Harland, N., and Lavalley, D. Biopsychosocial management of chronic low back pain patients with psychological assessment and management tools. *Physiotherapy*. 2003. 89;5:305-312.
- Hilficker, R., Bachmann, L.M., Heitz, C., Lorenz, T., Joronen, H., and Klipstein, A. Value of predictive instruments to determine persisting restriction of function in patients with subacute non specific low back pain. Systematic review. *Eur Spine Journal*. 2007. DOI 10.1007/s00586-007-0433-8
- Hurley, D.A., Dusoir, T.E., McDonough, S.M., Moore, A.P., Linton, S.J., Baxter, D. Biopsychosocial screening questionnaire for patients with low back pain: Preliminary report of utility in physiotherapy practice in Northern Ireland. *Clinical Journal of Pain*. 2000.16:3:214-228
- Hurley, D.A., Dusoir, T.E., McDonough, S.M., Moore, A.P., and Baxter, D. How effective is the acute low back pain screening questionnaire for predicting 1 year follow-up in patients with low back pain? *The Clinical Journal of Pain*. 2001.17:256-263
- Linton, S.J. A review of psychological risk factors in back and neck pain. *Spine*. 2000. 25:9: 1148-1156.
- Lethem, J., Slade, P.D., Troup, J.D.G., and Bentley, G. Outline of a fear avoidance model of exaggerated pain perception. *Behavioral Research and Therapy*. 1983.21:401-408.
- Linton, S.J and Hallden, K. Risk factors and the natural course of acute and recurrent musculoskeletal pain: Developing a screening instrument. *Progress in Pain Research and Management Vol 8*. 1997 Eds: Jensen, T.S., Turner, J.A., and Wiesenfeld-Hallin. IASP press. Seattle.
- Luo, X., Pietrobon, R., Sun, S.X., Liu, G.G., and Hey, L. Estimates and Patterns of Direct Health Care Expenditures among Individuals with Back Pain in the United States. *Spine*. 2003. 29:1:: 79-86.
- Pincus, T., Burton, A.K., Vogel, S., and Field, A.P. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. *Spine*. 2002 27:5:: E109-E120.
- Roland, M., and Morris, R. A study of the natural history of back pain. Part 1: Development of a reliable and sensitive measure of disability and low back pain. *Spine*. 1983.8: 141-144.
- Sen, A. Health: Perception versus Observation. *BMJ*. 2002.324:860-861
- Stalin, L.J. Multidimensional scaling. In: Grimm, L.G., and Yarnold P.R. (Eds) *Reading and understanding multivariate statistics*. 2003. Page 167. American Psychological Association . Washington DC.
- Stratford, P.W., Binkley, J., Solomon, P., Finch, E., Gill, C., and Morland, J. Assessing change over time in patients with low back pain. *1994 Physical Therapy* 74:528-533.
- Trouchon, M., and Fillion, L. Biopsychosocial determinants of chronic disability and low back pain: A review. *Journal of Occupational Rehabilitation*. 2000 10:2: 117-141.
- Vlaeyen, J.W.S. and Linton, S.J. Fear avoidance and its consequences in chronic musculoskeletal pain: a state of the art. 2000. *Pain*. 85:115-125
- Waddell, G., Sommerville, D., Henderson, L., Newton, M., and Main C.J. A Fear avoidance beliefs questionnaire (FABQ) and the role of fear avoidance beliefs in chronic low back pain and disability. *Pain*. 52:157-168.

- World health organisation. (WHO). International classification of functioning, disability and health. 2003. World Health Organisation. Geneva.
- Young, A.E., Wasiak, R., Phillips, L., and Gross D.P. Workers perspectives on low back pain recurrence: „It comes and it goes and comes and goes, but it’s always there’ 2011. *Pain*:152:204-211



## **Low Back Pain**

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This book includes two sections. Section one is about basic science, epidemiology, risk factors and evaluation, section two is about clinical science especially different approach in exercise therapy. I envisage that this book will provide helpful information and guidance for all those practitioners involved with managing people with back pain-physiotherapists, osteopaths, chiropractors and doctors of orthopedics, rheumatology, rehabilitation and manual medicine. Likewise for students of movement and those who are involved in re-educating movement-exercise physiologists, Pilates and yoga teachers etc.

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