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#### Abstract

The volume of evidence questioning the efficacy of traditional treatment methods for chronic low back pain sufferers is only equalled by that condoning a holistic, biopsychosocial assessment and treatment approach. Literature on this subject is often academic in nature and does little to offer practical advise to clinicians on how they can apply psychosocial principles to practice. This paper addresses the reasons behind the increasing number of chronic back pain patients, reviews the relevant psychological models that aid understanding of this client group, and offers basic practical advise on psychosocial assessment and treatment methods that can be applied by both specialist and non-specialist physiotherapists.

## Biopsychosocial management of chronic low back pain patients with psychological assessment and management tools

Physiotherapists play an important role in the management of chronic low back pain (CLBP) patients. Successful management of this client group poses a significant problem, however. Recent advances in this research area, specifically regarding psychological factors, have generated various principles and assessment techniques whose application can add to clinical effectiveness. There are also a number of existing psychological principles, not commonly referred to in the literature, that are important to understand when treating patients in chronic pain. The purpose of this paper is to review these principles and highlight the importance of their application into the practice of physiotherapy.

The prevalence of people consulting medical practitioners with CLBP has increased so dramatically in recent years that it has been referred to as a “20<sup>th</sup> century health care disaster” (Waddell, 1998). Only headaches and tiredness are more commonly reported to GPs than back pain (CSAG, 1994), with 60% of the population suffering from some form of back pain each year (Evans, 1996; Foster, 1998; McKinnon, 1997). People have always had back pain, however, and its prevalence is not thought to have changed for decades (CSAG, 1994), it is only the prevalence of people seeking medical attention for it that has changed. This has highlighted the fact that CLBP is one of the least successfully treated musculoskeletal conditions. A growing body of evidence shows that the majority of treatments for CLBP lack quality validating research and are, therefore, not evidence based (CSAG, 1994;

Evans, 1996; Clinical Evidence, 2001). It is also thought in some fields, that medical intervention is perhaps part of the reason for the drastic rise in disability secondary to CLBP (Gifford, 1998; Waddell, 1998).

This phenomenon has been partly attributed to the adoption of a unimodal medical model of low back pain in the post-war years, that allowed itself to be more guru, than scientifically led (Gifford, 1998). Prior to the adoption of the medical model of LBP, back pain was viewed by the majority as a normal part of life and was accurately treated as a self-limiting mostly benign occurrence. It has been people's perceptions of back pain that have changed over the last 50 years and medical treatments of this condition have tended to reinforced them. The existing literature recognises that for treatment to be successful it must adopt a multimodal, biopsychosocial approach (Adams, 1996; Cook, 2000; Gifford, 2000; Harding, 1995; Waddell, 1987; Waddell, 1998) and include cognitive behavioural interventions, which have been found to be effective in the treatment of CLBP (Van Tulder, 2000a). It also recognises exercise as the other most evidence based treatment for CLBP patients (Van Tulder, 2000b).

The genesis of the CLBP patient has also been made possible through societal changes, however. Only through examination of epidemiological and historical perspectives can the CLBP sufferer truly be put into perspective. Changes in society and technology have brought about a demand for better health care and an expectancy that medicine can provide it. The demand for equity, at least within most European societies, has also created the need for

social service systems and widely available health care, free at the point of delivery (Donaldson, 1993). The combination of these two factors has, in part at least, also made possible the CLBP patient (Pfungsten, 1997), (Waddell, 1998). Prior to this situation no possible benefit could be gained from complaining of CLBP and family would have to support ill members if they were to survive. It is speculative that in these circumstances there were less people suffering from CLBP and that out of simple necessity, disability from chronic pain was substantially reduced for those who did suffer.

Within physiotherapy there can be few experienced musculoskeletal practitioners who have not been touched by the recent plethora of research in the area CLBP, and specifically the psychological issues that surround it. Examination of increasing disability statistics secondary to CLBP (CSAG, 1994) reveal that dissemination of research information has not been enough to produce change however, and unfortunately this is not an uncommon phenomena (Hunt, 1996). Physiotherapy practice has yet to fully embrace and put to use the current information on psychological issues, enough to produce change (Pinnington, 2001). This can be demonstrated by examining the large list of Clinical Interest Groups within the Chartered Society of Physiotherapy (CSP) and noticing that the initials PIP (Physiotherapists Interested in Psychology), are missing. Although a mental health group has existed for some time this is a quite different area of specialty from that of chronic pain psychology. If it were not for the work of the PPA (Physiotherapy Pain Association), itself a comparatively new institution, in filling this void, physiotherapy would have no defined internal source of expertise on the

subject. When put into the context that the rules of professional conduct state that a preferably officially recognised group, able to form a “Responsible body of opinion”, is necessary to bring new techniques within physiotherapies scope of practice (CSP, 1996), this situation becomes significant.

Part of the problem, however, is the great disparity between the literature available to increase knowledge on the subject and that available to allow clinicians to apply that knowledge for the benefit of their patients. One aim of this paper is to overview psychological principles that may be useful to clinicians dealing with CLBP patients, and more generally with all chronic pain patients. Rehabilitation therapists of all kinds are in a privileged position of being able to spend enough time with patients to apply psychological principles for their patients benefit. In many cases we spend more time with the patient than any other medical practitioners, and this places upon us a great responsibility to spend that time well.

### **Assessment**

Psychological assessment techniques, usually in the form of questionnaires are often used in specialist pain clinics and spinal assessment units but as government guidelines suggest, should be used when treating all chronic pain patients (CSAG, 1994). CSP Core Standards (2000) also state that “Taking account of the patients problems, a published, standardised, valid and responsive outcome measure is used to evaluate the change in the patient’s health status”. In light of the importance psychological issues are known to have on LBP patients this statement should be applied to

psychological and physical factors equally. It is rightly beyond physiotherapy scopes of practice to formally assess and treat specific psychological disorders, and indeed such disorders are no more common among chronic pain patients (Waddell, 1998). It is essential, however, for clinicians dealing with chronic pain patients to have a good understanding of the relevant psychological models and methods of assessment available (CSAG, 1994; Waddell, 1998) and to apply this knowledge to practice.

There are a number of well-validated, psychologically based questionnaires available for use by clinicians. Some of the most useful, and simple of these are the Hospital Anxiety and Depression scale (HAD), (Dunbar, 2000, Thompson, 2000), the Modified Somatic Perception Questionnaire (MSPQ),(Deyo, 1989) the Zung Depression Inventory (Leung, 1998), the Yellow Flags Questionnaire (Linton, 1998), and the Coping Strategies Questionnaire (Robinson, 1997, Rosenstiel and Keefe, 1983) . Many of these have been shown to be effective as prognostic indicators and useful specifically with CLBP patients. It is important to note, however, that recognised training is necessary, both practically and legally, when dealing with questionnaires such as the HAD and Zung Depression Inventory, and that although they can be used and scored by other medical professionals this information in the physiotherapy setting should be in the form of audit measurement and referral criteria for psychological input. It is not appropriate for untrained individuals to act directly upon such scores with the intent of providing psychological intervention, but it is essential the possible presence

of such disorders is recognised and that treatment within the physiotherapy remit is provided with such factors in mind.

Specifically, depression and anxiety are a commonly reported characteristic of the CLBP patient (Basler 1993; Harding, 1995; Lefebvre, 1981; Tyrer, 1992), and some assessment of these is essential. The HAD scale is a short and easy to use tool and despite its age continues to attract analysis and debate (Dunbar, 2000). Further to this Main (1992) produced a recommendation that the Zung Depression Inventory be used with the MSPQ to form what he termed the “Distress and Risk Assessment Method” or DRAM, specifically for use when assessing CLBP patients. This method has been further recommended by Waddell (1998) and can simply categorise patients as normal, at risk, or clearly distressed. This enables any therapist to recognise, using an objective outcome measure, when a patient’s management must carefully address psychological issues.

### **Psychological Models of Chronic Pain**

Before using such tools it is necessary for therapists to have an understanding of the basic psychological models that are used to conceptualise and treat abnormal or maladaptive behaviour patterns. The most dominant of these are cognitive and behavioural models. The behavioural model, when applied to the chronic pain patient (CPP), attributes maladaptive behaviour to learnt reinforced responses. Its explanation for the “sick role” is that family and friends of the CPP positively reinforce pain behaviour through solicitation, such as taking over domestic duties that are



perceived to be difficult for the patient secondary to their behaviour when doing those tasks. These pain behaviours such as overt pain complaint or wincing during movement are therefore reinforced, and “operantly conditioned”, making them more likely to recur (Adams, 1996, Turk, 1984). Through such mechanisms patients may develop almost reflexive behaviors in response to stimuli such as temporary pain increases or even simple movement.

This type of psychological change can be used to define a chronic patient, with initially adaptive responses such as resting and complaining of pain to stimulate the help of others, becoming maladaptive after the normal healing time of the injury has passed. Treatment approach in this case includes family and patient in an educational regime designed to minimise reinforcement of pain behaviour and positively reinforce non-pain behaviours (Kerns, 1986). The behavioural model also loosely encompass social modeling theory, which states that our early experiences of pain, significant others behaviour towards us during these experiences, and the witnessing of the behaviour of significant others to their own pain, may influence our pain behaviour in later life (Anderson, 1987, Gifford, 2000).

The main limitation of this model is that it does not seek to understand the individual’s personality or perceptions and may not necessarily address the reason for the original formation of the maladaptive behaviour patterns (Adams, 1996). The Cognitive model approaches the problem by trying to assess an individual’s unique set of pain beliefs, problem solving abilities and coping strategies. This model presumes a direct link between cognitions and

behaviours. Maladaptive cognitions such as pain causing damage are challenged to make the CPP re-evaluate them. It is assumed that if maladaptive cognitions can be changed, behaviour change will follow (Adams, 1996). There are a number of validated instruments designed to identify damaging cognitions and beliefs such as the Fear Avoidance Beliefs Questionnaire (Waddell, 1993) or the Coping Strategies Questionnaire (Robinson, 1997). Indeed, there is a strong argument that fear avoidance beliefs have a part to play in creating disability in the CPP (Gifford, 2000; Philips, 1987). Fear avoidance theory proposes a vicious circle phenomenon, where a patient believes pain is damaging and so while pain persists they avoid excess movement. As a result muscles tighten and less movement is required to instigate a sensation the patient may perceive as pain (e.g., muscle pull or joint stiffness).

This mechanism is mirrored neurophysiologically through central sensitisation (Siddall, 1997, Rabey, 2001) with neurological pain pathways and their corresponding areas in the brain adapting over time. Through central sensitisation, which can be most simply thought of as practice, and therefore improvement of pain pathways, the amount of peripheral stimulation needed to produce pain perception reduces over time. Also the perceptual field of a peripheral nerve may increase so that pain may be felt in a larger area than previously. As a result of this mechanism, although local pathological processes may become less significant, pain perception and the area pain is perceived may increase. Secondary to these changes, fear avoidance and maladaptive behaviour may become self-reinforcing through a pain loop to

produce overt pain complaint during even simple tasks. It is even possible to hypothesise that a central pain loop may develop where a patient may perceive pain from the area although no local pathological process is taking place. PROVIDE A REFERENCE HERE – BASED ON WHAT YOU HAVE READ. THIS SHOULD BE SUFFICIENT. I/YOU/WE COULD GO INTO THIS IN DETAIL, BUT I THINK IT IS BETTER TO SIMPLY MAKE THE POINT – AS REQUESTED.

### **Behavioural Factors**

Behavioural and neurophysiological issues, as outlined above, should be considered during patient contact, and for clinicians such as physiotherapists this involves confidence in their accurate assessment of the patient's physical state. Only in this way can a clinician safely ignore maladaptive behaviour such as unnecessary wincing and groans of pain. Indeed, positive reinforcement by a clinician of inappropriate pain behaviour may be strong and long lasting. To avoid damaging reinforcement of a patient's maladaptive behaviour that may easily lead to increased disability, rapid redirection of conversation that dwells unnecessarily on pain sensation is essential (Basler, 1993), and balancing this with the need to gain a subjective history is difficult. Also evaluation or treatment of the patient, with pauses as necessary, must continue despite what may sometimes be overt and loud complaints of discomfort (Basler, 1993, Turk, 1984). Equally, successful completion of tasks during the consultation that may have caused pain should be considerably positively reinforced as pain behaviour may decrease through verbal reinforcement only (Turk, 1984). This is often a skill therapists may find more

difficult to develop than those of redirection and non-reinforcement of pain behaviour that may develop naturally with experience.

Over successive treatments, or even during a lengthy assessment, pain behaviour may increase. It is important in this situation to have confidence in the original assessment as some form of “extinction burst” is likely to occur when previously reinforced behaviours are ignored (Lerman, 1995). Extinction burst is the process where an action that previously elicited positive reinforcement is subject to a period of increase before it subsides. In other words, a behaviour that was previously rewarding, such as groaning to avoid a task, is exaggerated if at first it does not work, in a redoubled attempt to gain the expected result e.g., not having to do the task. Consistency of approach is vital in this scenario as giving in and reinforcing at this stage may be more damaging than if the behaviour was solicited originally.

Working with significant others, such as family, present at the appointment is a more contentious issue. Certainly attention needs to be paid by the clinician to them to attempt to assess any obvious unnecessary solicitous behaviour. Also partners should be encouraged not to do things for the patient that they may find difficult. Explained from the point of view of aiding the rehabilitation program by increasing activity, this advice may carry over and have a significantly positive effect. Just as it is important to give adequate explanation to patients about their condition, including significant others when explanations are given should be considered. If this is possible it ensures important messages are not diluted as they are passed on and therefore

correct action by those around the patient, as well as by the patient themselves, is facilitated.

### **Cognitive Factors**

Patient education is important for many reasons but before any information is given it is vital to learn what the patient already knows. The first thing a patient will have done on realising they have a problem is to seek informal advice, and this will initially tend to be non-medical advice from significant others (Skevington, 1995; Tyrer, 1992). Even though this initial advice is unprofessional it may be subject to a primacy effect (Cunnington, 1997) and unless another more acceptable explanation is given it will often remain as the patient's belief.

This belief may be difficult to challenge because someone they trust will have explained it to the patient in words they can understand. Also, initial consultations with clinicians often only provide fragmented technical explanations specific to the speciality of the examiner. The daunting effect of being examined and the sometimes disorienting amount of questions asked and information given may only serve to confuse the patient. Further to this as time elapses the CPP may be the recipient of multiple, often conflicting, opinions from other medical staff (Skevington, 1995). This may build mistrust, confusion, anger, or even hopelessness in the patient who may still not have received an explanation for their problem they understand, and may still not have been asked what they think the problem is and how they feel about it (Skevington, 1995). This scenario should be considered in the context of a

study by Sofaer (1994) that found of all the variables examined, including financial worries, lack of information was the best predictor of negative mood.

When initially talking to the patient it is important, therefore, to discuss the patients views about their condition and what they think is wrong. Such listening can be as useful as hands on treatment (Trede, 2000). Unfortunately although communicating with patients on an emotional level is important, many therapists fail to do this, and the context of communication between patient and therapist remains intellectual (Gard, 2000). The necessity to gain patients views ,and inevitably feelings, about their problem is reflected in the CSP Core Standards (2000) which note that specific written account of the patients perceptions and expectations should be taken during assessment. It is also essential to discover what other opinions the patients has been given by either medical staff or significant others. In this way tact can be used if it is necessary to contradict some of these opinions. This is always a difficult task, but is better done knowingly than inadvertently. Examples of suitable questions that may be asked, with or without the additional use of a specific questionnaire, to help assess both maladaptive cognitions and behaviours may include the following, and although it is not always practical to document the answers to all these questions, the patient's impression of their condition, prognosis, and expected treatment are essential to record (CSP, 2000).

1. What do you think the problem is?
2. What have you been told so far about what may be wrong with you?
3. How much better do you expect to get?

4. How do you think you will get better?
5. Are there any regular tasks at home you are no longer able to do because of your pain, such as washing or walking the dog, and who does them now?
6. Has your pain stopped you from taking part in any regular social activities?
7. Do you have any major worries about your condition or questions you have, that have so far not been answered?

When giving explanations to patients, time should be taken to explain the diagnosis and treatment without the use of misleading terms that patients may take more literally than they are intended. Unfortunately, especially concerning back pain, a multitude of potentially damaging but commonly used terms exists, such as something being “out of place”. Use of such terms may in some cases be technically correct, such as a disc that has a small herniation, but the patient’s perception of this may be that a large and important structure in their back is floating around causing endless damage, and putting them at risk of permanent injury, and such beliefs are not uncommon (Gifford, 1998, Harding, 1995). Clinicians must try to avoid the use of such indiscriminate terminology. Certainly if such terminology is used it must be put into perspective and explained clearly to the patient. The powerful effect that unclear or ambiguous information may have on the patients’ psychological status must not be underestimated. Equally the significantly positive effect of giving the patient a reasonable explanation must also be remembered.

Considerable care must also be taken when discussing test results also, such as X-rays and MRI's. Many patients are told that they have arthritis and that their spine is getting worn out, even use of words such as "crumbling spine" are not unheard of (Gifford, 1998). Without being told that these changes are normal, and are not necessarily the cause of their pain (CSAG, 1994), a patient may assume that they have a serious disease and that further activity will only worsen it. It is important, therefore, to think about every word that is said regarding a patient's condition, and to consider constructive explanation as equally important as other forms of treatment. When the likely benefits of a passive treatment are weighed up against the possible negative effects of not fully explaining information to the patient, and communicating with them regarding issues that are important to them, the issue of time constraints not allowing good explanation and hands on treatment becomes redundant.

### **Treatment**

It is rare that clinicians will not physically interact with a patient attending treatment, and certainly there is a strong expectation that some form of physical treatment will occur. It is argued by some clinicians that even if it is known that treating a patient will only give short-term relief then this should be done. The chance to temporarily reduce pain should always be weighed up against any problems this may cause, however. Passively treating a patient who will only get short-term relief reinforces the use of medical resources and after treatment stops and the pain inevitably returns the patient is more likely to again seek treatment (Tyrer, 1992). Each time this happens the patient may



become more reliant on medical help and subsequently, self coping techniques are eroded (Dolce, 1986). Eventually the patient may then become reliant on medical resources for help, when often their own resources, if they were to use them, may be equally effective in controlling their pain. Treating themselves gives the patient the added advantage of maintaining some feeling of control and self-efficacy (Dolce, 1986), both of which are important positive prognostic indicators in the CPP (Thompson, 1997).

The decision not to treat must, of course, be a well-informed one and is contentious, especially where elderly patients are concerned. The value of time spent educating the patient on dealing with their pain themselves and encouraging them should not be underestimated, however, and this may not happen during an appointment where treatment for pain is the perceived priority, and time is limited. It should also be remembered that unpredictable reinforcement, equitable to the that gained from gambling, is a very strong form of reinforcement (Yackulic, 1986). If a patient is being seen regularly for active treatment such as exercise, therefore, it is vital that even if the patient is having a painful day they are not occasionally given a passive short-term pain relieving treatment as this reinforcement may as strong as if the patient was regularly given such a treatment. It is also important for patients to understand that although they may have a period of increase pain they have to learn to cope with it, and can do so effectively, if educated correctly. Through this practice, after discharge, a patient in a flare up may rely on their own resources, rather than seek re-referral. Long term coping of this kind may prevent disability in CLBP patients and can be inhibited through incorrect use

of pain relieving modalities and inappropriate prioritisation of passive treatment interventions.

### **Conclusion**

The importance of psychological factors in chronic pain, especially back pain, should not be underestimated. Examination of simple treatment practices from a psychological perspective, such as how explanations are given and how pain relief is prioritised, can enable a therapist to be more effective in their treatment of chronic pain patients. It is necessary, however, for therapists to not only be aware of concepts such as simple reinforcement theory, but to apply this knowledge for the benefit of individual patients. At least, application of these principles may ensure therapists obey one of the founding precepts of medicine “first do no harm”.

Although “biopsychosocial” is a familiar phrase, it’s meaning is often lost in rhetoric or is simply ignored. One interpretation of “biopsychosocial” is that the clinical reasoning process that is applied to the physical diagnosis and treatment of patients, should be applied in equal measure to enable accurate assessment and management of that patient socially and psychologically. This approach should, therefore, include accurate measurement of related factors and this recommendation has been given both by the CSP in the core standards, and through national organisations such as Clinical Standards Advisory Group on back pain.

Being effective in the management of chronic musculoskeletal pain conditions is a significant challenge, and only by combining familiar core skills such as exercise prescription with other techniques such as cognitive behavioural therapy (CBT), is it possible to meet that challenge. Some may question the labelling of the simple thought processes and treatment adjustments described in this paper as CBT. It is undeniable, however, that by giving an explanation to a patient with deliberate thought regarding what effect this may have on their perception, is a form of cognitive intervention. It is equally easy to conceptualise simple ignoring of patients overt pain behaviours during a task, as a behavioural intervention.

When this definition of CBT is explored, it is not difficult to come to the conclusion that those particularly skilled in the management of CLBP patients may be justified in labelling their treatment as a mix of exercise and CBT. Certainly, under the weight of evidence available, the chances of therapists being successful in managing patients without the use of CBT skills is minimal, and such practitioners may, therefore, be underestimating their skills base. It is perhaps even possible to hypothesise that although standard evidence based treatment by physiotherapists may be labelled as exercise, it may be that it is the instinctive use of CBT by some therapists that provides the effective intervention during a course of treatment, over and above any provided through exercise prescription. Certainly in either case, both evidence and professional guidelines confirm that successful treatment of chronic musculoskeletal pain should include the application of psychological principles, such as those outlined in this paper, in both assessment and

treatment and that this application should in no way be exclusive to specialist practitioners.

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