Unveiling the physical therapies

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Abstract

Either through referral by a medical practitioner or self-referral many patients with musculoskeletal problems receive some form of physical therapy. There are several highly trained professional groups who deliver this treatment. Due to lack of regulation, however, there are also many untrained and unregistered therapists delivering treatments for musculoskeletal conditions. For a number of reasons firm evidence-based protocols on physical therapy management are limited. This combined with the aforementioned means that practice can vary markedly. It is thus important for general practitioners to be able to make some assessment of physical therapy quality. This paper aims to unveil some of the practices of physical therapists, discuss issues related to treatment and make suggestions on what constitutes quality physical therapy.

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Introduction

Musculoskeletal problems are a common reason for presenting at general practitioner (GP) surgeries.[1,2] Although epidemiological study findings vary in magnitude, it is clear that musculoskeletal disorders are associated with high costs in both economic and personal terms for societies around the world.[3–5] This has been one of the driving forces behind the World Health Organization's Bone and Joint Decade 2000–2010. Factors such as increasing age and body mass mean that the impact of the problem is likely to increase.[3]

Anatomical sites most commonly affected include the back, shoulder, neck and knee.[4,6–8] Although patients can have a one-off bout, pain in these anatomical sites is often recurrent or chronic in nature.[4,6,9,10] For some conditions, at some sites, spectacular management solutions such as joint replacement exist. This, however, is not the norm and most musculoskeletal disorders lack an intervention with such a dramatic, long-lasting improvement. The lack of a quick, easy cure from science-based modern medicine means that many patients seek out a range of other practitioners for treatment.[11] What patients may not realise is that if there were a known, safe, effective cure for their condition, the practitioners of modern medicine would be dispensing that treatment.

Once patients leave the environs of modern medicine they enter a largely unregulated world in which new treatments can be dreamt up and introduced on a whim. There are few formal structures to screen new treatments, and approaches have frequently been peddled across the globe long before randomised controlled trials (RCTs) have been performed. Within the ranks of university-trained physical therapists there has been a growing awareness that this situation is not acceptable. In response there has been an increase in research and wider implementation of the philosophies behind the evidence-based medicine movement.

The purpose of this article is to give readers a behind-the-scenes look at the practices of the physical therapies and to suggest key principles underlying ethical, quality therapy. For this piece, the term physical therapies refers to physiotherapy, osteopathy and chiropractic. Many of the points discussed are also applicable to areas in the complementary and alternative medicines (CAMs). In Europe, physiotherapy is the most common non-pharmacological approach used in the treatment of musculoskeletal pain.[12] As medical practitioners often refer or advise patients to seek out physical therapy it is important that they have realistic expectations of treatment outcome and also know how to identify good and bad practice.

Patients receiving physical therapy can be broadly divided into two categories. The first comprises patients who require rehabilitation following surgery or trauma to the musculoskeletal system. The conditions of these patients are usually relatively straight forward and require a progressive graded rehabilitation programme to restore normal joint and tissue mobility and then strengthen any deconditioned body regions and systems. Other therapies can be added but the core of the programme is the repetitive stretching and loading of tight/weakened tissues to restore optimal function. The second group of patients is usually more complicated to manage and includes overuse disorders, degenerative conditions and spinal pain. These conditions are often aetiologically complicated and frequently have inputting factors from each of the bio-psycho-social triad. It is these disorders that are difficult to manage for all practitioners and it is the physical management of these disorders that this paper will now discuss.

Treatment

Medicine has been described as a blend of science and art.[13] The same could be said of the physical therapies but with 'art' heavier in the mix. The goal of research in all health professions is to increase the

quantifiable, explainable and reproducible science element. The physical therapy professions of chiropractic, osteopathy and physiotherapy have much in common. There is a great deal of overlap in both techniques and philosophies.[14] There are probably as many differences within as between these professional groups. What is more consequential to the delivery of care is the individual therapist rather than his or her professional label.

Those working in the physical therapies draw on a wide range of techniques. Some key approaches include the following:

- Joint and soft tissue mobilisation, manipulation and massage
- Various forms of specific and general exercise
- Lifestyle advice
- Ergonomic advice and management
- Electrotherapy
- Acupuncture
- Taping and bracing

Arguments rage about which treatments are best and in what combinations for different conditions. Many RCTs have been carried out to help inform these decisions but there are few firm conclusions. Systematic reviews and meta-analysis also fail to give therapists clear guidance on treatment selection. This said, there are trends within the evidence base and inferences can be drawn. These will now be discussed but it must be remembered that these points refer to average effects. In certain individuals, spectacular and long-lasting improvement of symptoms can and do occur. This, however, is not the usual outcome and a satisfactory explanation of these events is lacking. This situation has led to more research looking for subgroups in what are frequently heterogeneous patient populations.

An important initial point to make is that no matter which physical treatment a clinician or researcher wishes to endorse, it is possible to find a selection of papers published in peer-reviewed journals supporting that approach. The converse is also true. Even systematic reviews of physical interventions can arrive at differing conclusions. Weakness in primary research methodology, differing definitions, different review strategies and an evolving pool of primary research papers can all add to a confusing picture. Despite all this, there are trends that can be useful. One of the clearest is that while on treatment, patients improve. It does not seem to matter greatly what the physical therapy agent is; in the short term, while receiving treatment, people feel better.[8,15–26]

Reports of improvement while on treatment in trials could be explained in many ways: natural resolution, specific treatment effects, non-specific treatment effects (placebo), bias or a combination of these factors. These are also potential influences in orthodox medicine and medical trials. Trials of orthodox medical interventions, particularly pharmacological agents, have developed sophisticated strategies to account for or neutralise these influences. In trials of physical therapies blinding, convincing placebos, no treatment control groups are, for a number of reasons, more difficult to implement. This means that when the methodological quality of physical therapy trials are assessed against the standards of orthodox medicine they usually rate poorly. This lack of quality may be one of the reasons that so many different physical therapy modalities seem to demonstrate short-term effectiveness in RCTs.

Untangling specific treatment effects from natural variation and the placebo effect is very difficult in physical therapy trials. Physical therapy is usually delivered as a package of care with different approaches and treatment modalities mixed in a way that the therapist considers most appropriate for the individual patient. In addition, as mentioned before, the non-specific effects of treatments or placebos are often difficult to control. That so many different treatments bring about short-term improvement tends to suggest that these non-specific effects are significant. Although not referring directly to physical therapy, Hyland[27] in an excellent commentary on meta-analyses of CAMs and psychotherapy concludes that therapists themselves bring about the effects of treatment rather than the particular intervention being used. Hyland[27] refers to this as the 'human effect'. This may well also be pertinent to the physical therapies with Foster[28] arguing that evidence is mounting that the beliefs and preferences of practitioners and patients play an important role in the outcome of treatment for musculoskeletal conditions.

Another important trend across the majority of trials is that the effects of treatment tend to trail off fairly quickly. Longer-term follow-ups at 6–24 months usually demonstrate convergence of treatment, placebo and control groups.[29–31] This is particularly evident in trials assessing passive therapies where no long-term lifestyle modification or education has taken place. To make lasting gains, efforts must be directed towards combining medical management with altered patient behaviour and lifestyle variables.[2,23,32–36]

What does it all mean?

A great many explanations are given by physical therapists when describing how their treatments work: Breaking down scar tissue, realigning subluxed joints, loosening stiff joints, restoring energy flows, releasing trigger points and stabilising unstable joints are just a selection from the myriad. There is little evidence to support these claims. Rather than these largely biomechanical explanations, perhaps they all work on similar physiological and neurophysiological systems.[37–39] During the decades since the formulation of Melzack and Wall's pain gate theory much research has been carried out on the phenomena of pain modulation. Although there are still unknowns, it is clear that at numerous points through the nervous system there are opportunities for non-pharmacological inhibition and facilitation of nociception.[40] As well as numerous 'gates' through the nervous system, there are different approaches to open and shut them. Even though few physical therapists set out with the goal of deliberately modulating neural processing, a combination of patient beliefs, expectations and neural input from the periphery means that nearly all approaches will be making some use of this system.

Other avenues of research that may help explain some of the short-term effects of physical therapy come from the growing field of psychoneuroimmunology (PNI). Psychological processes can influence a variety of neuroendocrine systems including the hypothalamic pituitary adrenocortical, sympathoadrenomedullary and hypophyseal pituitary gonadal axes. Lymphoid tissues are also innervated by the autonomic nervous system.[41] Through these systems the brain can influence a wide variety of physiological functions including aspects of immunological functioning.[42–44] All physical therapy treatments will involve interaction with and alteration of psychological processes. Combining PNI systems with the body's innate pain modulation systems gives therapists a wide range of powerful routes for symptom modification. It is not surprising that so many therapy approaches result in short-term improvement of symptoms.

Understanding more of the body's own powerful symptom- and health-modulating systems is important. It would also be beneficial to understand how therapists access and modulate them. More importantly for therapists, doctors and patients is the realisation that therapist-delivered treatments that rely on patient passivity can only provide short-term gains.[22–26] Long-term alterations to the structure and function of musculoskeletal tissues, the cardiovascular system, neural processing

and endocrine function require patient participation.[32] Alterations in cognition, behaviour, exercise, diet, work and other lifestyle variables are essential to bring about long-term changes. This point is raised in reference to musculoskeletal conditions but the same applies to many other chronic or recurrent health problems.

Altering patients' long-term health behaviours is a difficult process that involves a considered individualised process to maximise the chances of success.[45] This area has not been thoroughly researched in relation to the physical therapies. Of the many potential health-influencing behaviours, exercise is the physical therapy modality most commonly evaluated. Exercise is one of the few physical therapy interventions that can be performed by patients on their own. As such, it can be prescribed as part of long-term self-management.

Strategies that may help with long-term management

Genetic factors excepted there are many health-influencing variables that individuals have some control over. This is not new information and various health laws and government educational campaigns have been implemented with the goal of manipulating these variables to improve the health of the population. Mostly, these government driven initiatives have been directed at disorders outside the musculoskeletal field. The bio-psycho-social inputs of many musculoskeletal disorders mean that like other disorders, patients can influence the onset and long-term course of their condition. Three variables that could potentially play a role in the course of musculoskeletal disorders include exercise, work and psychosocial factors.

Exercise can be broadly divided into two categories: general exercise such as walking, swimming, cycling, yoga and aerobics and specific exercise such as a programme of strengthening and/or mobility/stretching exercises for a symptomatic part of the body. General exercise has been demonstrated to be beneficial in decreasing the incidence of musculoskeletal pain as well as improving symptoms and function in those with musculoskeletal pain.[33,46–53] Although there is substantive evidence that exercise is associated with improved general and musculoskeletal health, there is less evidence for the best type, dose and mix in individual situations.[54] In some studies specific exercise programmes have also been demonstrated to improve long-term outcomes for certain musculoskeletal conditions.[2,35,46,55–58] This is tempered by findings that for some conditions specific exercise does not seem to help.[59,60]

Alterations to aspects of an individual's work life could also potentially bring about long-term improvements. Weevers et al[61] in their systematic review found that many musculoskeletal problems encountered by GPs have some aetiological input from patients' work. The logical implication is that for these patients some modification to their work practices should take place. Although patients are frequently signed off work to rest there are many other management strategies available. Modification of duties, altered ergonomics, task rotation, decreased hours and graded return to work are all means of keeping people at work or returning them to work in an environment less likely to aggravate their symptoms. These are fairly standard occupational health practices but current evidence on their effectiveness is mixed or lacking.[46,62–64] This is not surprising given the heterogeneity of research participants, the requirement for individualised approaches, the difficulties of diagnosis and the multifactorial inputs associated with many of these conditions. All these factors make investigation with standard medical RCT designs cumbersome. Despite the difficulties, the high social and economic costs of musculoskeletal problems in the workplace warrant ongoing research.[65]

Various psychosocial factors have been shown to have a strong influence on the reporting and behaviour of individuals with musculoskeletal conditions.[66–72] Potential influencing variables in this field are numerous and it is beyond the purview of this paper to discuss these in detail. There are many quality reviews available and for succinct summaries readers are directed to any of the national evidence-based guidelines on managing acute or chronic spinal pain.[75] For the sake of an example, fear avoidance beliefs and catastrophising will be discussed.

Fear avoidance and catastrophising are closely related and refer to incorrect patient beliefs. Fear avoidance beliefs refer to the inappropriate belief that a pain response always means more tissue damage. Pain in the acute phase of an injury serves a protective role to injured tissues. In this scenario pain is appropriately interpreted as a signal to avoid excessive loading and thus further damage to an injured part of the body. However, many chronic musculoskeletal pains have long passed beyond the remodelling phase of healing. Interpreting pain in the same way in this situation will prevent the necessary movement/loading/exercise to rehabilitate the affected part of the body. In addition to the local effects of disuse, inappropriate avoidance of activity could also result in deconditioning in other areas and systems of the body. It has been demonstrated that there is a strong connection between inappropriate fear avoidance beliefs and disability.[67,71,72] Interestingly, Coudeyer et al[73] found that one in six French GPs had high fear avoidance beliefs and were thus reluctant to advise physical activity for their low back pain (LBP) patients. This finding is reinforced by that of Poiraudeau et al[76] who found that rheumatologists with high fear avoidance beliefs were less likely to implement evidence-based guidelines on work and activity for patients with subacute LBP.

The closely linked concept of catastrophising also refers to inappropriate beliefs. An example would be the belief that back pain will result in paralysis or that most back pain is due to serious damage to the spine. This and fear avoidance beliefs both require reassurance and education from health professionals. This should also be combined with an appropriate individualised graded rehabilitation/exercise programme. Physical therapists are ideally positioned for this role. A variety of primary and secondary research has been undertaken to assess the effectiveness of strategies designed to alter psychological variables. Results from these studies are mixed but experts in the field agree that given the strong influence of psychosocial factors, research on their manipulation should continue.[46,74]

Summarising this section involves reiterating that there is compelling evidence that many individual variables can influence the onset and course of musculoskeletal disorders. Not so clearly understood is the interplay between these variables and the ability of therapists to manipulate them to help with the long-term management of chronic and recurrent musculoskeletal disorders. There is some evidence to support the promotion of exercise, healthy work practices and psychological approaches to aid in the long-term management of musculoskeletal conditions. As with almost any area in health there is a need for much more research. However, enough information is available for therapists and doctors to realise that quality management of these conditions requires more than passive pain-relieving treatments.

Summary

Many chronic and recurrent musculoskeletal disorders have complicated aetiological backgrounds. Equally complicated is quantifying then managing this multitude of intertwining inputs. Once the difficulty of this is appreciated it is easy to understand why quick, easy fixes are

so illusive. The lack of easy effective medical treatments has been filled by the physical therapy professions and a variety of other groups. Many patients with musculoskeletal symptoms gain symptomatic relief from a wide range of therapist-delivered techniques and modalities. This must be balanced by informing patients that for most people passive physical therapy treatments will only provide short-term improvement. Both patients and doctors should understand that for long-term improvements, physical therapy management must incorporate patient involvement and lifestyle change. This should be considered when doctors assess the quality of physical therapy their patients receive.

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