



# Global Overview of the Models of Physiotherapy Practice: A need for integration towards better patient care

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## **SUMMARY**

Self-reported chronic conditions have a negative impact on quality of life globally. Indeed, it constitutes the most common reason for visits to the physiotherapist. This emerging development calls for the integration of available physiotherapy models with a view to suggesting a way forward in patient care. Biomedical and biopsychosocial models are the main treatment approaches in medical practice and are also applicable in physiotherapy. However, the former seems to receive more attention than the latter in physiotherapy practice. Although, tissue repair is paramount in the restoration of function, the attainment of the pre-morbid health status of patients may remain a mirage unless there is a holistic approach to patient management. Considering the relevance of physiotherapy in alleviating long-term chronic pain and dysfunction in patients, there is the need to re-visit different existing models in clinical practice with a view to integrating them for better health care service.

**KEYWORDS:** Patient care, integration, models

## **INTRODUCTION**

Training programmes in physiotherapy entail thorough assessment of patients, which often culminates in the formulation of treatment goals, both on short- and long-term bases. More often, however, treatment efforts are largely directed towards the resolution of pathology with less emphasis on the social and psychological status as regards the presenting conditions. Health is best understood in terms of a combination of biological, psychological and social factors, rather than purely biological terms (Santrock, 2007). Anecdotal evidence has shown that a high rate of recurrence of clinical dysfunction tends to be more common in treatment strategies that are limited to the alleviation of pathology. More often than not, health care professionals pay little or no attention to the psychosocial aspect of their patients' health. A study of eight countries in Europe indicated that arthritis is the commonest chronic orthopaedic

condition, and that it has a negative effect on health-related quality of life and the sufferers' quality of life (Alonso et al, 2004).

Two published treatment models that are well-documented in the literature are also applicable in physiotherapy practice (Vonk et al, 2004). The first is the biomedical model, in which pain is considered as an indicator of physiological damage and the treatment is directed towards alleviating the pathologic condition in order to abate the pain (Lindstrom et al, 1992). In this case, pain serves as a guide to the effectiveness of the administered treatment. The biopsychosocial model, on the other hand, explains the persistence of pain caused by the accompanied psychological and social factors, other than the underlying pathology. The treatment approach in the biopsychosocial model is thus aimed at decreasing pain behaviour (operant model) and increasing healthy

behaviour. The principles of the biopsychosocial model are premised on the view that maladaptive behaviours are learnt, thus, they can be modified through new learning experiences (Linton, 1994). The approach is largely time-contingent, in which case patients regulate their daily tasks as permitted by their pain perception, with the ultimate goal of developing coping skills whilst recovering from the chronic clinical conditions.

The proportion of patients suffering from cardiovascular, neuromuscular and musculoskeletal clinical conditions is increasing, with appalling psychological effects arising from the burden precipitated by these conditions (DiMatteo et al, 2007). In physiotherapy practice, the demand to contribute to the optimal well-being of patients is constant. A need arises, therefore, to embrace the holistic approach to patient management, without disregarding the traditional biomedical mode of care. This analytical submission presents a global overview of the models of disablement, the concept of rehabilitation, the biomedical model, and the biopsychosocial model as they are applicable in physiotherapy, and stresses the need for their integration into patient management strategy so as to improve health care delivery.

## MODELS OF DISABLEMENT

Disablement refers to the various impacts of chronic and acute conditions on the functions of specific body systems, basic human performance, and people's functioning in expected and personally desired roles in the society (Verbrugge and Jette, 1994). Three types of disablement models have been identified: Nagi, the International Classification of Impairments, Disabilities and Handicaps (ICIDH), and the National Centre for Medical Rehabilitation Research (NCMRR) models (Kisner and Corby, 2007). Although, slight variations exist in these models, there is a complex interrelationship among the terms used in describing the components of the disablement, including disease/pathology, impairment, disability/functional limitation, and handicap. Despite wide applications of these models in clinical practice, however, they are characterized by down sides because of the perceived focus on the disease and a medical-biological view of disability as well as lack of attention to the person with the disability.

In response to this shortcoming, the World Health Organization (2001), through a wide consensus, developed the International Classification of Functioning, Disability

and Health (ICF). The new conceptual model integrates both functioning and disability, and is characterized by a biopsychosocial model of disablement that provides a coherent perspective of various aspects of health. In the ICF model, equal attention is paid to both the living conditions of the patient and the disease condition itself. The components of ICF include: impairment, which implies problems in body function or anatomical structure such as significant deviation or loss; activity, which is defined as the execution of specific tasks or actions by an individual; activity limitations, considered to be difficulties which an individual might have in executing activities; participation, conceptualized as an encompassing involvement in a life situation; participation restrictions, considered to be problems that an individual might experience in real-life situations, and environmental factors which depict the influence of society on the person with regard to the presenting condition (Jette, 2005).

Disablement is therefore a global term that reflects all the diverse consequences which any disease, injury or congenital abnormality may impact on human functioning at different levels. Recently, risk factors were incorporated into the components of disablement models to underscore the assumption that disability can be prevented, eliminated or reduced if the risk of occurrence or the severity of pathology, impairment or functional limitation is reduced (Kisner and Corby, 2007). Therefore, carefully designed plans of treatment in physiotherapy can have a positive impact on every aspect of the disablement process.

Physiotherapy as a clinical discipline requires common pathways through which its practice and research can be guided. Over the last decade, disablement models have been explored extensively with the evolving realization that they provide appropriate framework for clinical decision-making and research (Jette, 2005). The models have been found to be useful in two ways (Jette, 1994): first, to generate hypotheses about the potential effects of disease, injury or congenital abnormalities on the functioning of specific body parts, physical functioning and mental actions, as well as on perceived roles or behaviour in daily life; second, to describe the various personal and environmental factors that can accelerate or retard the disablement process, including predisposing risk factors that propel disablement as well as interventions applied to avoid, retard or reverse the disablement process. It goes without saying that the adoption of this model is a clinical prerequisite for physiotherapy practice.

## CONCEPT OF REHABILITATION

There has been a paradigm shift in the concept of rehabilitation from a medical to a social model, whereby rehabilitation service delivery is considered as a fundamental human right. This idea was conceived to place more emphasis on a demands-driven or needs-oriented approach instead of the supply-driven approach, which was in use until a decade ago (Finkenflugel, 2007). This shift was prompted by the failure of stakeholders in rehabilitation to meet the demands of the recipients. For instance, despite the proven professional prowess of physiotherapists in exercise regimens for a wide range of ailments, very little has been achieved in terms of disability reduction, particularly in Africa (Amusat, 2009). Considering this scenario which is a result of the shortfall in the supply of trained physiotherapists in developing countries in addition to other factors, very comprehensive treatment strategies are required to overcome this prevailing situation. In line with these views, Olaogun et al (2009) opined that the upsurge in the prevalence of disabilities following civil wars, political instability and strife, coupled with poverty in many developing nations of Africa, calls for a pragmatic rehabilitation model through which affected persons can be rehabilitated and reintegrated into their community. It is believed that a better management outcome is possible if an innovative treatment approach or the modification of an existing one that is geared towards self-care is adopted. The concept of rehabilitation should be viewed and practiced beyond physical or functional restoration of persons with disabilities, but should also include issues that relate to quality of life, economic and political freedom, as enshrined in the United Nation's standard rules on the equalization of opportunities for people with disabilities (United Nation, 1993).

It is therefore imperative for physiotherapists, as prominent members of the rehabilitation team, to extend their services to the needy through home-based care that encourages community involvement. This is bound to reduce overall health care cost. In addition, the use of locally available resources for therapeutic benefits will be encouraged, and members of the community will be empowered to take control of their health (Campbell and Foulis, 2004).

## BIOMEDICAL MODEL

In this model, pain is the main indicator of the extent of

tissue damage and the treatment approach is directed towards removing the pathology in order to either abate or alleviate the pain (Vonk et al, 2004). The treatment administered is guided by the intensity of the pain being experienced by the patient, leading to a pain-contingent approach (Lindstrom et al, 1992). Some notable modes of physiotherapy action through which tissue repair and treatment are accomplished have been documented (Watson, 2011). These are discussed below.

### Mechanical

The causative factors of joint dysfunction include disease conditions, injury, overuse and immobilization (stress deprivation), which can result in faulty and pathological joint structures that are amenable to physiotherapy modes of action. For instance, during weight-bearing exercises, most tissues respond favourably to a gradual progressive loading to meet the increasing mechanical demand. Also, therapeutic exercise influences cell shape and physiological functions and can have a direct mechanical effect on matrix alignment at the local level (Curwin, 2006). The local mechanism of connective tissue response to exercise appears to involve the cells detecting tissue strain and modifying the type and amount of tissue synthesized. These are taken as an advantage whilst prescribing procedures such as manipulation, therapeutic exercise, massage and gait training in physiotherapy practice.

### Gross Physiology

Physical impairment, due to movement disorders caused by injury, disease or any other health-related conditions, is a potential indicator for physiotherapy services. Physiological responses of living tissues to stress, either in healthy or diseased states, inform the adoption of basic principles of exercise prescription programmes such as overload, adaptation, progression, specificity, recovery, overtraining, detraining and individual responsiveness (Swain and Leutholtz, 2007). Physiotherapists integrate and apply their knowledge of anatomy, physiology, pathology, behavioural science, kinesiology and pathokinesiology across the continuum of patient management from initial examination to discharge planning. The knowledge and application of motor learning and motor skills acquisition to exercise instruction and functional training become extremely relevant to physiotherapists in practice (Kisner and Corby, 2007).

### Chemical

Strong evidence exists to support the contention that physiotherapy influences a range of cytokines and chemical mediators in healthy tissues, and particularly in diseased or damaged tissues (Gahbiani, 2003). Electrophysical agents such as ultraviolet rays, interferential current and therapeutic exercises exert significant effect on the tissues' biochemical environment. These effects can be modified for specific indications and treatment options.

### Bioelectric

There is evidence of the occurrence of bioelectric activity in musculoskeletal tissues. This becomes important in the control of normal physiological events and the responses of the tissues to injury, trauma and disease. Various interventions such as electrical stimulation, shortwave diathermy and ultrasonic therapy influence the bioelectric environment, hence their therapeutic effects on the tissue (Watson, 2008; Issacson and Bioebaum, 2010).

### Neuromodulation

Manual therapy, special exercise techniques and the use of electrochemical agents such as electromyographic-triggered electrical nerve stimulation (EMG-triggered ENS) have already gained integration into several physiotherapy models. For example, following a brain injury such as stroke, new central connections are formed by appreciable re-organization within the central nervous system in the early recovery stage. Spontaneous recovery at this stage is so remarkable that it is difficult to detect the impact of the new intervention strategy (Stephenson, 1993). Several management strategies are being used by rehabilitation teams to take advantage of this physiological phenomenon. Emerging evidence suggests that the use of electrical stimulation at the early stage of rehabilitation may be advantageous in the rehabilitation of the upper limb following a stroke (Powell et al, 1999; Fransisco et al, 1998; Bello et al, 2009).

Knowledge of specific pathologies are relevant as background information in choosing interventions, however, this should be complemented with the understanding of the social and psychological components of the presenting disease. A patient's pain origin, for instance, may not necessarily be anatomical or physiological. For instance, how do we tackle the heart pain in a patient with osteoarthritis of the knee, who is also HIV

positive? What will be the line of management in the case of clients with substantial job-related psychosocial problems? Given that no two patients suffering from the same clinical conditions are entirely the same, more meaningful management strategies can only be formulated through the integration of more models.

## BIOPSYCHOSOCIAL MODEL

The basic concept of this model is premised on the conviction that health is best understood in terms of a combination of biological, psychological and social factors rather than purely in biological terms. Unlike the biomedical model in which every disease process is explained in terms of underlying deviation from normal functions due to injury, pathogen, genetic or developmental abnormality, the biopsychosocial model (BPS) emphasizes the treatment of disease processes, taking into consideration biological, psychological and social influences upon a patient's functioning (Halligan and Aylward, 2006). A growing body of empirical literature suggests that patients' perceptions of their health and the threat of disease, as well as barriers in their social or cultural environment, appear to influence the likelihood that they will engage in health-promoting or treatment behaviours (DiMatteo et al, 2007). The model has been found most applicable in behavioural-moderated illnesses that are associated with many risk factors including type-2 diabetes mellitus, osteoarthritis, obesity, hypertension and cardiac problems. BPS focusses more on treating the person rather than the impairment.

The treatment principle is rooted in behavioural graded activities (BGA) to modify daily tasks in order to minimize or delay dysfunctions. Operant behavioural therapy, as a sub-unit of BPS, is largely adopted by physiotherapists and it focusses on decreasing pain behaviour whilst increasing healthy behaviour. It is guided by the patients' functional abilities, using time-contingent methods to increase their activity level (Lindstrom et al, 1992). The cardinal features of BGA include the opportunity to discuss the patient's ideas about pain and its causes, explanation of the development and maintenance of pain, reassurance of patient's safety to increase activity level, formulation of therapy aims based on the patient's main complaints that are related to basic daily activities, and determination of the level of engagement based on the pain-contingent measure at baseline. Afterwards, both patient and physiotherapist set time-contingent treatment quotas for each activity according to the baseline scores, primary therapy aims and on the

behaviour that can be derived from the baseline measure (Vonk, 2004). These are gradually increased in order to meet the set goal within a predetermined period.

Activities performed are documented and are discussed in subsequent treatment sessions and the achievement will be reinforced whilst disregarding the pain behaviours. Positive reinforcement and patients' perceived improvements are chosen as sources of motivation. Lastly, discussions are generalized at the end of the session for the learned health behaviour and management of relapses of the conditions. Operant behavioural therapy was found to be beneficial in the management of chronic pain to waiting list control groups on outcomes such as pain experience, mood effects other than depression, social role and for the expression of pain behaviour (Morley et al, 1999). Biopsychosocial multidisciplinary rehabilitation was also found to be more effective than the other rehabilitation methods for chronic neck and shoulder pain (Karjalainen et al, 2001).

## CONCLUSION

Physiotherapy modes of action are rooted in broad-based models beyond what is generally perceived. However, the incorporation of these models into clinical practice is commonly stereotyped to the pathology-oriented routine. A more rewarding management outcome is more likely in a comprehensive treatment plan that embraces integration of relevant models as found appropriate in a given clinical condition. In order to redirect physiotherapy practice towards the total care of patients, physiotherapists should understand their modes of action in terms of the cultural context in which they operate and the specific needs of the patients, without compromising professional ethics.

## RECOMMENDATIONS

In view of the difficulties commonly encountered when integrating new treatment policies into existing modes of practice, the following strategies should be considered to ensure optimal integration of the available models:

1. The use of relevant outcome measures to assess physical impairment, activity limitation, participation restriction and environmental factors. This should be ensured before intervention, during intervention, at the point of discharge, and during the follow-up period.
2. Modes of physiotherapists' actions should be executed based on cultural contexts and the prime needs of the patients.
3. The training curriculum should be reviewed so as to incorporate all relevant models into the training programmes, particularly at the entry level.
4. The formulation and adoption of clinical practice guidelines at various levels to ensure more pragmatic implementation of treatment policies.

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