

# The Link between Psychomotor Disorders and Physical Therapy

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## Abstract

The evolution of the individual in ontogenesis has been studied throughout life and on all sides of development. Studies in the field based on medical rehabilitation performed by a full team such as doctors, physiotherapists and psychologists and not only have shown that the link between the patient's psychological state and exercise are factors in full dependence and any imbalance can trigger irreparable effects. Psychology is the science that studies the laws of formation, development, functioning and deficiencies related to psychism; it includes a series of fundamental concepts that include: psychic processes, psychic phenomena, psychic attributes, psychic states or psychic activities. Psychic phenomena are the component elements of psychism. In a sense, the psychic phenomena are manifested by external facts, by our behavior, by the motor actions started, by gestures or verbal actions; in the other sense, psychic phenomena are manifested by inner deeds, as the form of ideas, images, feelings, and desires. The motor acts without psychism would be only simple automatisms, without human specifications of adaptation, while the psychism without motor acts would be deprived of the fundamentals of formation and functioning as well as of its production mechanisms. **Objective:** The objective of this study is to highlight the causal problems of delayed medical recovery in relation to the psychological and emotional factors. This desktop review aims to identify psychoemotional disorders in the case of subjects with operated lumbar disc herniation and aims to adapt a specialized physiotherapeutic protocol by adapting to CIF. The result of this study will be found in the percentage of socio-professional reintegration of the subjects with operated lumbar disc herniation and implicitly the increase in the quality of life. **Conclusions:** 1) For an effective functional recovery, a psycho-emotional balance is needed; 2) A positive attitude actively influences medical rehabilitation; 3) Regaining physical, cognitive and social activities depend on the degree of psycho-emotional impairment.

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## Keywords

Hyperkinesia, Hypokinesia, Tics, Body Schema Disorders, Apraxia

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### 1. Introduction

This article is a desktop review and has the role of studying the human behavior of subjects with operated lumbar disc herniation in relation to the psychomotor deficiencies found in the current case study.

Motor rehabilitation began as early as 1919, after the First World War, due to the need to prevent injuries during the war and at the same time, the disabilities that occurred, and as a specialization, it was adopted in 1947, after the Second World War.

Nowadays, medical recovery is rapidly rising due to the human need to use physical exercise for prophylactic purposes and not only, and the discovery and development of new rehabilitation techniques have a favorable and rapid response in medical recovery.

In the context of medical physical rehabilitation, physical exercise used as a fundamental element in physical therapy has an essential role in restoring the functional potential of people who are in different situations of incapacity or functional disability.

Therefore, the analysis of this pathology from an interdisciplinary perspective can help the rapid functional recovery of subjects with operated lumbar disc herniation.

In recent years, operated lumbar disc herniation has an increasing incidence of occurrence due to the unbalanced lifestyle, daily activities, and lack of information on the post-operative repercussions. Low back pain has an increased frequency, being experienced by approximately 70% of people at some point in their lives.

A 2014 study reporting on the incidence of herniated discs in adults states that lumbar disc herniation is the most common cause of radiculopathy, with an estimated annual incidence ranging from 1.6% in the general population to 43% in certain areas of activity.

The evolution of the individual in ontogenesis has been studied throughout life and on all sides of development.

Psychomotor development is based on a series of primary acts that make possible the gradual appearance of movement patterns and their passage on the mental plane, characteristic of the age of study.

Mental and motor functions are the fundamental elements of the human psyche. At birth, both are potential and rudimentary, but they evolve and develop in a direct relationship. Subsequently, each follows more and more differentiated hierarchical evolutions, but keeps permanent connections between them [1].

M. Epuran (1976) considers that psychomotor appears as both an aptitude and

a complex function of regulating individual behavior and includes the participation of various processes in psychic functions that ensure both the perception of information and the proper execution of the response. Therefore, psychomotor skills represent the psychic function that realizes the set of mental regulations regarding motor activity.

Psychomotricity is the mental function that encompasses a set of mental adjustments regarding motor activity, in the sense of “activity scheduling” [2].

At the same time, psychomotor skills express the relationships between people, interdependence and mutual conditioning between the motor and psychic planes that include psychic elements related to body movements that are manifested by voluntary movements used in daily actions and activities.

The term “psychomotor” has the role of defining and representing motor weakness, then it was related to the brain areas that controlled motor life and was initiated by E. Dupre (1892) [3].

Traditional psychology divides psychic phenomena into processes, activities and psychic attributes [4].

#### I. Psychic processes cognition primary (sensory)

- Sensations
  - Perceptions
  - Representations
- Superior (logical)
- Thinking
  - Memory
  - Imagination
- Affective
- Affective dispositions
  - Affects
  - Emotions
  - Feelings
  - HOBBIES

#### Volitive (will)

#### II. Psychic activities

- Communication
- Game
- Learning
- The work

#### Stimulating and facilitating conditions for activity

- Motivation
- Careful
- Habits.

#### III. Psychic personality traits

- Temperament
- Skills

- Character

In the case of psychomotor disorders, the following can be described: disorders in the organization of psychomotor skills (hyperkinesia, hypokinesia, tics), disorders of the body scheme (hemiasomatognosia, anosognosia, autotopognosia, “phantom” limb, macro/microsomatognosia) and disorders of praxis (ideational apraxia, motor apraxia, ideomotor apraxia, constructive apraxia, special forms of apraxia).

Categories:

Depending on the components, we can mention:

- Ideomotricity (the set of representations about movement);
- Motor intelligence (ability to choose and adapt movements to the concrete react situation);
- Body scheme (static and dynamic image about one’s own body and its possibilities);
- Laterality (functional inequality in favor of the right or left half of the body);
- Praxis (all learned motor acts);
- Balance;
- Coordination.

Each of these disorders has specific manifestations and may interfere with recovery progress in physical therapy.

#### I. Disorders of organization of psychomotor skills

1) Hyperkinesia (psychomotor agitation, tachykinesia, psychomotor instability) refers to the degree of exaggeration, as form and intensity, of psychomotor activity, and is characterized by: uncoordinated acts/movements, disorganized motor behaviors, without will control; insomnia, general anxiety, distractibility, excitability, impulsivity; and low degree of frustration tolerance; wide continuous and fast pantomime and mobile mimicry.

Hyperkinesia can manifest as a symptom in euphoric states, high positive emotional states or mild intoxications, personality disorders, consciousness disorders, and organic brain disorders.

Hyperkinesia also manifests itself as a stand-alone syndrome, assimilated with Attention Deficit Syndrome, due to the complex picture in which the inability to concentrate attention is added to the psychomotor disorganization. This type of syndrome can be identified from childhood. Individuals with such a syndrome may show features [5]: the tendency to move continuously, inability to keep the same position for longer, stereotyped gestures, increased irascibility, aggression, with insults and violent gestures, intense anxiety; incomprehensibility of behavior (those around can not understand the reason for certain behaviors of the hyperkinetic and he can not always explain them); symbolic speech; emotional lability, manic attacks, weakened will. Such children, due to the inability to concentrate, have difficulty learning, although in terms of intellectual abilities are normal.

2) Hypokinesia is a state of psychomotor inhibition, which is characterized by

poor mimicry, slowness in motor manifestations, and slowness in speech (bradylation), slowing of mental development. The hypokinetic gives the impression that he lacks will and energy. This disorder is manifested by: brain disorders, depression, epilepsy, and schizophrenia.

Hypokinesia has several forms of manifestation, which can be ranked from the least intense to the most intense.

This describes [6]:

a) Bradykinesia is the lightest form with the above characteristics, at a light or medium intensity), which can also manifest in general non-pathological conditions;

b) The motor dam consists of a gradual or abrupt cessation of psychomotor activity and speech (shock states);

c) The stupor is a state of complete or almost complete immobility, in which the individual does not respond to stimulation, is inert and the mimicry remains fixed in an expression of pain/anxiety or is completely inexpressive;

d) Catatonia, a serious state of inexpressiveness and immobility, with a lack of motor initiative and associated with the persistence of the individual in certain positions for a long time; it can be described by food negativity and abolition (total lack of will).

3) Ticks are simple, untimely, similar and repetitive movements, involuntary and accessible to consciousness (the individual may be aware of the tick or may not control it).

There are head and neck or face tics, limb tics, phonatory or respiratory tics, verbal tics, and digestive tics (swallowing and aerophagia).

Tics manifest as symptoms in psychoanalytic or obsessive states. It is known that the appearance of tics is due to a negative internal tension, due to a mental trauma or repressed needs.

In children, tics can be associated with some particular personality traits, excessive emotion, mental childishness, extreme shyness or feelings of guilt. There are learning difficulties depending on the degree of impairment.

## II. Disorders of the body scheme

1) Hemiasomatognosia is a disorder of the body that manifests on one half of the body left or right, in the case of epilepsy or parietal lesions. In the conscious form of hemiasomatognosia, the patient accuses the loss of the perception of half of the body, as a result of the blockage of the somesthetic afferents (nervous pathways that ensure the transmission of sensory information to the areas of brain projection). Unconsciously, the patient considers that he is missing half of his body [7].

2) Anosognosia is that tubing in which the patient ignores the presence of hemiplegia. It is caused by lesions in the hemisphere of the non-dominant brain, followed by hemiplegia.

3) Autotopognosis represents the patient's inability to locate or name the body parts correctly, although, previously, he had a well-structured body scheme. It can manifest in small or large areas.

4) The "phantom" limb is the disorder in which the patient perceives an am-

putated limb (has a sensation of pain or itching).

5) Autoscopy is a hallucinatory-looking disorder, in which the patient perceives his own body in the external visual space in front or at a distance.

6) Macro/microsomatognosis is characterized by the perception of one's own body or other parts of the body as having different dimensions from the real ones, smaller or larger. If these disorders of different body size rendering have a broad emotional involvement, the patient has an obsessive self-concern being linked to alleged bodily disfigurement or dysmorphophobia.

### III. Disorders of praxis

Apraxia is a disorder of intentional and organized gestures. Apraxia represents the subject's inability to perform voluntary psychomotor acts (or intentional gestures), adapted to the purpose and/or conditions, although the general cognitive capacity is normal and the execution organs are intact.

Apraxia can occur in the case of diffuse brain damage, aphasia or dementia.

Depending on the involvement at the motor or intellectual level, apraxia can be of several types:

a) Ideatory apraxia [8]—the subject can correctly execute the motor gestural sequences but cannot unite and organize them;

b) Motor apraxia—in which executive characteristics of the motor acts are affected such as precision and speed regardless of the difficulty of the motor act;

c) Ideomotor apraxia—elementary and complex motor acts are affected; the subject has a correct image of the motor act but cannot actually achieve it;

d) Constructive apraxia—the representation of objects in space is affected and can be highlighted by drawing but perspective is lacking and shapes are produced altered—or in the improper construction/arrangement of objects in space. This type of apraxia does not affect the subject's ability to recognize colors and interpret different drawings.

In addition to these forms of apraxia, there are some special forms of apraxia, such as: buccal-facial apraxia, writing apraxia, gait apraxia, and dressing apraxia (usually associated with unconscious hemiasomatognosis).

Disability characterization refers to the value attached to an individual's situation or experience when moving away from the norms or norms of the individual's universe and is the result of the relationship between the individual's performance or status and the expectations of the individual or group. Disability thus represents the socialization of a deficiency or disability and, as such, reflects the consequences on the individual from a cultural, social, economic and environmental point of view—arising from the presence of the deficiency and disability that has occurred.

Disability occurs when there is interference with the ability to sustain what might be termed the “survival role.

Research on “disability” began at least in the 1950s, when a famous case in the history of the disability movement where people with disabilities in Le Court Cheshire, England, asked “experts” in “group dynamics” to support the fight against local managers and professionals for greater control over their daily lives

and although this research took 3 years, it turned out that the social scientists were impartial and followed their own agenda. This was confirmed by the final research report, which rejected the residents' complaints and recommended a reworking of the traditional practice, although they categorized the institutional life as "living death" [9].

The behavioral disorders, previously presented, can benefit from any therapy. Their identification can help in the application of a specific therapy. The same thing happens in the case of operated lumbar disc herniation.

## 2. Objective

The purpose of this study is to highlight the causal issues of delayed medical recovery in relation to the psychological and emotional factors in subjects with lumbar disc herniation operated on.

This desktop review aims to identify psychoemotional disorders in the case of subjects with operated lumbar disc herniation and aims to adapt a specialized physiotherapeutic protocol by adapting to CIF.

In physical therapy, in order to make the report from a medical point of view, these elements must be seen both from a mental and cognitive point of view, and the motor results, and the disabling results, help the therapists in classifying patients and applying a specific treatment.

## 3. Materials

Approaching the pathology from the point of view of psychomotor disorders can be done with the help of CIF to intersperse these disorders with the specifics of the pathology.

It aims to include behavioral disorders to place them in a deficit stage so that therapeutic methods are tailored to the degree of impairment.

The International Classification of Functioning, Disability and Health (ICF) emerged in the 1970s [10] and was used as a framework for organizing and documenting information on functioning and disability (according to WHO 2001). It conceptualizes functioning as a "dynamic interaction between a person's health status, environmental factors, and personal factors", integrates major models of disability—the medical model and the social model—as a "bio-psycho-social synthesis", and recognizes the role of environment in creating disability, as well as the role of health conditions [11].

The ICF is focused on the following key terms: impairment—"any loss or abnormality of psychological, physiological or anatomical structure or function", disability—"any restriction or lack (resulting from an impairment) of the ability to carry out an activity in the manner or within the range considered normal for a human being" and disability—"a disadvantage for a particular individual, resulting from a deficiency or handicap, which limits or prevents the performance of a role that is normal (depending on age, sex, social factors and cultural) for that individual" [12].

Such a synthesis was made within the National Institute of Medical Expertise and Recovery of Work Capacity, in the Department of Physical Recovery and Balneology, Bucharest, Romania. The psychomotor disorders were classified as motric activities and poor motor skills as a result of the surgical intervention. For this aspect, a statistical study was done on 1396 subjects with lumbar discopathy, phase III, which had as its goal, socio-professional reintegration as a result of functional deficiencies.

The subjects included in the study were classified as having mainly coordination motor deficits and having different types of aphasia.

Physiotherapy was used as a treatment method. Physiotherapy is based on physical exercise. This, adapted to the pathology, proved to give favorable results for the functional medical recovery of operated lumbar disc herniation, in the case of patients with multiple psychomotor deficiencies.

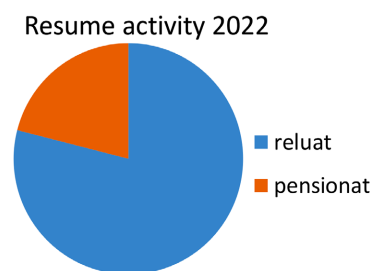
#### 4. Results

The results obtained were the following:

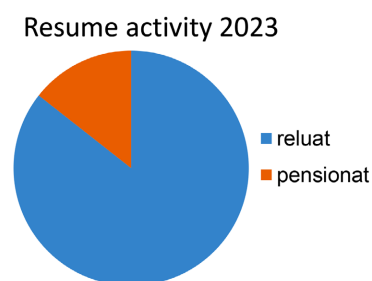
Regarding the subjects' resumption of activity and socio-professional reintegration, the subjects followed the medical recovery protocol indicated by the specialists.

For the year 2022, after the applied medical recovery protocol, a percentage of 21.0% subjects who qualified for retirement were recorded. On the other hand, the subjects who resumed their professional activity were in the percentage of 79.0% (**Figure 1**).

With regard to the statistics aiming at the resumption of activity in 2023, until August 2023, for the subjects who followed the indicated medical recovery protocol, we have the following percentages (**Figure 2**).



**Figure 1.** Resumption of activity of subjects with DVL in 2022.



**Figure 2.** Resumption of activity of subjects with DVL in 2023.



The subjects who were retired were in proportion of 14.4%, while the subjects who resumed their professional activity were in a percentage of 85.6%.

From the previously presented figures, we can see that the number of subjects who followed the medical recovery protocol and resumed their professional activity is significantly higher, compared to the subjects who were retired but did not recover their socio-professional activity.

The determining factor of this statistic is the medical rehabilitation that contributed to the recovery of increasing the quality of life.

## 5. Conclusions

The main conclusions that can be drawn from this study refer to the fact that disorders of any kind can lead to imbalances in the body of a physical, mental, psychomotor, psychoemotional and cognitive nature. Their persistence over time can lead to changes in self-perception that affect both the individual and those around them.

The problem of psychomotricity and its correct treatment can help the subject in question to an efficient and faster integration into society, but also in the resumption of daily activities.

Adapting therapy to the dysfunctions given by psychomotor disorders can have favorable results in socio-professional reintegration.

For an efficient functional recovery, a psycho-emotional balance is needed.

A positive attitude actively influences medical rehabilitation.

The recovery of physical, cognitive and social activities depends on the degree of psycho-emotional damage.

The application of CIF can contribute to the development of a specific and sustainable treatment protocol over time.

The identification of psychomotor deficiencies can help to develop an appropriate rehabilitation protocol and contribute to functional recovery in the case of subjects with operated lumbar disc herniation.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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