



The Rehabilitation Psychologist

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PROFESSIONAL SECTION:

ELEMENTS OF PSYCHOSOCIAL REHABILITATION (SERIES: PART-1)

Psychology has never underestimated the social agency in its studies. Psychological existence is attributed to social reference; hence social approval becomes fulcrum for our functioning. Advent of biopsychosocial model of health has acknowledged that there are complex, interdependent relationships between the physical and biomedical features and the psychological and social factors that present concomitantly. Society expects an individual to contribute for the cost of providing security, name, power and status. It is never ready for disability, although it is inevitable. Persons with disability find themselves socially alienated, unable and sometimes unworthy to influence the course of their lives, and longing for connection but terrified of rejection. The society needs time to adjust, and individuals in immediate contact with the person with disability have to share the responsibility and do double work all their lives. Foster (2011) says "Epidemiological studies have not only highlighted that psychological and social factors are associated with disability but also have shed light on the way in which these factors serve as prognostic indicators, or obstacles to recovery, predicting which patients will have a poor prognosis. It has been argued that the transition from illness to wellness might be more strongly associated with psychosocial factors than with physical factors."

It is important for professionals to have insights into individual's perception of their condition and personal relevance and meaning it has for them so that interventions can be directed towards meeting specific needs (Donna Falvo, p.2). The course of an illness over time, including the actions taken by individuals, their families, and health professionals working with them to manage or shape the course of the condition, is called a trajectory. The concept is important to professionals working with individuals with chronic illness and disability because it implies a continuum and emphasizes the social and environmental impact on the condition. Chronic illness and disability produce significant change and consequently stress because individuals must deal with a change of customary lifestyle, loss of control, disruption of physiological processes, pain or discomfort, and potential loss of role, status, independence, and financial stability. If perceptions of the changes associated with chronic illness or disability seem insurmountable or beyond their ability to cope, stress can be overwhelming. Stress cannot be easily quantified, but it can be interpreted from the behaviors exhibited by those experiencing chronic illness or disability.

When demands exceed psychological, social, or financial resources, stress may be manifested in a variety of ways, such as noncompliance with recommended treatment, self destructive behaviors such as substance abuse, hostility, depression, or other harmful responses. When individuals have confidence in their ability to maintain control over their destiny and when they believe that changes, although inevitable, are manageable, stress is less pronounced. Those who are able to adapt and cope effectively and mobilize resources are more successful in managing stress and achieving more stable outcomes (Falvo, 2005). These coping strategies are defined as the active processes and behaviours that the individual actually try to employ to help self to manage, adapt to or deal with a stressful situation. Coping entails constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing the individual's resources (Taanila, 2001). Coping strategies, hence are dynamic and employ psychological resources lifelong to earn equilibrium. Some of the coping strategies are:

DENIAL: The diagnosis of chronic illness or disability and the associated implications can be devastating and anxiety provoking. Denial is a coping strategy some individuals use to negate the reality of a situation. In the case of chronic illness or disability, individuals may deny that they have the condition by avoiding recommended treatment or by denying implications of the condition. In the early stages of adjustment, denial may be beneficial in that it enables individuals to adjust to the painful reality of their situation at their own pace, preventing excessive anxiety. When denial continues, however, it can prevent individuals from following medical recommendations or from learning new skills that would help them reach their maximum potential (Falvo, 2005)

REGRESSION: In regression, individuals revert to an earlier stage of development and become more dependent, behave more passively, or exhibit more emotionality than would normally be expected at their developmental level. In the early stages of chronic illness or disability, returning to the state of dependency experienced in an earlier stage of development can be therapeutic, especially if treatment of the condition requires rest and inactivity. When individuals continue in a regressive mode, however, it can interfere with adjustment and the attainment of a level of independence that

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would allow them to reach maximum functional capacity. (Falvo, 2005)

COMPENSATION: Individuals using compensation as a coping strategy learn to counteract functional limitations in one area by becoming stronger or more proficient in another. Compensatory behavior is generally highly constructive when new behaviors are directed toward positive goals and outcomes. For example, someone who is unable to maintain his or her level of physical activity because of limitations associated with his or her condition may turn to creative writing or other means of self expression. Compensation as a coping strategy can be detrimental, however, when the new behaviors are self-destructive or socially unacceptable. For example, someone who experiences disfigurement as a result of his or her disability may become promiscuous as a way of compensating for the perception of physical unattractiveness. (Falvo, 2005)

RATIONALIZATION: As a coping strategy, rationalization enables individuals to find socially acceptable reasons for their behavior or to excuse themselves for not reaching goals or not accomplishing tasks. Although rationalization can soften the disappointment of dreams unrealized or goals unreached, it can also produce negative effects if it becomes a

barrier to adjustment, prevents individuals from reaching their full potential, or interferes with effective management of the medical condition itself. (Falvo, 2005)

DIVERSION OF FEELINGS: One of the most positive and constructive of all coping strategies can be the diversion of unacceptable feelings or ideas into socially acceptable behaviors. Those with chronic illness or disability may have particularly strong feelings of anger or hostility about their diagnosis or the circumstances surrounding their condition. If their emotional energy can be redefined and diverted into positive activity, the results can be beneficial, making virtue out of necessity and transforming deficit into gain. As with all coping strategies, diversion of feelings can have negative effects if feelings of anger or hostility are channeled into negative behaviors or socially unacceptable activities. (Falvo, 2005)

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VISITOR'S SECTION: BRAIN AND BEHAVIOR

THE NEURON

It is over 60 years since Hodgkin and Huxley made the first direct recording of the electrical changes across the neuronal membrane that mediate the action potential. In a subsequent series of elegant experiments they, along with Bernard Katz, discovered that the action potential results from transient changes in the permeability of the axon membrane to sodium (Na^+) and potassium (K^+) ions. Importantly, Na^+ and K^+ cross the membrane through independent pathways that open in response to a change in membrane potential (Barnett, 2007).

Human is unique due to its brain and the very existence is due to the brain. Unlike some parts of our body which have become nonfunctional in our daily living, Brain is the only part of the body where the most primitive part is yet functioning and influences our daily activities. Brain is the most complex structure which challenges the human knowledge; we are yet to know many things about its functioning. Amazingly, it is not a single organ but collection of neurons working in orchestra. When we mention "Neuron" it is a basic cell and a "Nerve" is always a bundle of several neurons closely tied. Human brains comprise tens of billions of neurons, each linked to thousands of other neurons. A single neuron is the computational unit of this processor. Structurally it is like a thread having two ends, a head and tail and hands. Like any other structure it has a form and shape. It is like an Organization with office and its branches everywhere it does business. As every branch has central office, every neuron has an office called nucleus. It has two functions: firstly, it keeps the information (genes, consisting of Deoxy-ribonucleic acid (DNA)) of the neuron and secondly, it builds RNA (ribonucleic acid), which plays a role in transferring information from DNA to protein-forming system of the cell, thus keeping it alive by templating proteins as well as be active themselves. Now, the branch has to communicate within itself and with other branches, in the same way a neuron must communicate within and with other neuron for smooth running of Organization. All neurons are also set up structurally to both

send and receive information. Neurons send information via a channel called axon. The neuron receives information via dendrites. So, axon is sender of information and dendrite is taker of information. Axons cover the majority of space between nerve cells. Structurally, dendrites look different from an axon, in that, dendrites are spiny and highly branched but axons are smooth and is intermittently covered by myelin sheath.

INTERNAL OPERATIONS AND THE FUNCTIONING OF A NEURON: The essential aim of neuroscience according to psychological perspective is to understand (1) how single neurons operate, (2) how one nerve cell communicates with another (3) how whole nervous systems operate and control our behavior. The most amazing thing about neuron is its physical properties, which constitute functional properties. A nerve cell communicates "within" itself electrically and can convert a signal of almost any kind into an electrical current. The common communication "between" two neurons is from electrical to chemical, and neuron converts light, sound, temperature, pressure and even the earth's magnetic field into an electrical signal. The communication starts in the cell body and travels down the axon to be sent on to the next neuron in the chain. A neuron is not physically connected to other neuron but an axon stops just near the other neuronal dendrite where it intends to transfer the message. The space between one neuronal axon and other neuronal dendrite is called synapse. There are approximately 10,000 synapses per neuron. As mentioned, that communication is generally chemical to electric signals. The axon releases a chemical called neurotransmitter into this space (synaptic cleft) and this neurotransmitter are picked up by other neuron systematically by other neuron, which takes up the responsibility to transfer the information.

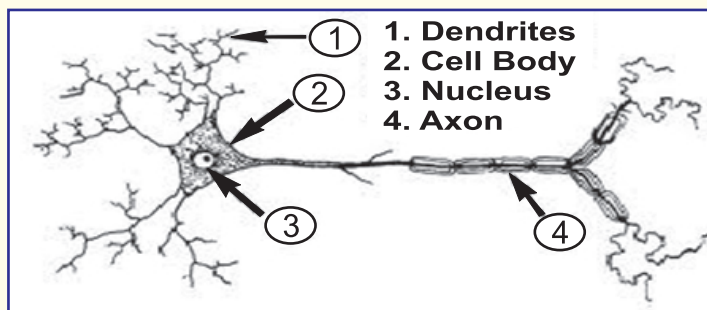
ANATOMY: The neuron has got three distinct regions: **1)** The cell body or soma (head); **2)** The cell membrane (skin of the cell);

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3) A number of branching dendrites (hands); **4)** A single axon—may or may not be myelinated. (tail)

These neuronal communications may have one of two actions on the target cell: either it promotes an action—excitation or they may stop the ongoing action— inhibition. The excitatory and inhibitory responses of neurons are summed. This activity takes place within the receptive components of the neuron, the dendrites and cell body or soma. An electrochemical impulse that travels from cell body to axon is called Action potential.” The amplitude of an action potential is independent of the amount of current that produced it. In other words, larger currents do not create larger action potentials. Therefore, action potentials are said to be all-or-none signals, since either they occur fully or they do not occur at all. The frequency of action



potentials is correlated with the intensity of a stimulus. This is in contrast to receptor potential whose amplitudes are dependent on the intensity of a stimulus.

ACTION POTENTIAL: Communication within the neuron—primarily electrical. The structure of neuron is determined by its membrane (skin). The cell membrane serves as a barrier to enclose the salt water inside the neuron, and to exclude certain substances that float in the fluid that bathes the neuron. Among many things, neuronal membrane is responsible for certain important functions:

- ♦ allowing certain ions out of the cell and letting others in,
- ♦ establishing an electrical potential inside the cell, conducting an impulse,
- ♦ being sensitive to particular neurotransmitters and modulators.

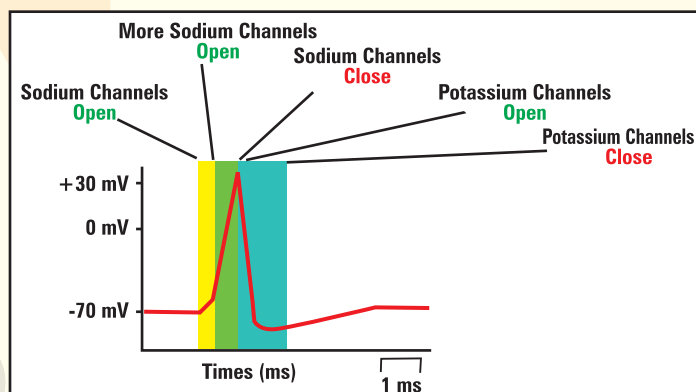
Neuron is suspended in salt water and it does not conduct electricity like a wire. Instead, they maintain a difference between salt concentrations inside and outside the cell membrane. To understand why this might make electricity, it is imperative to understand what a salt is.

ELEMENTS CAN BE GROUPED INTO TWO TYPES: Those that tend to lose electrons when combining with others (thus becoming positively charged) and those that tend to gain

electrons (thus becoming negatively charged). A salt is made of a pair of such opposite elements, in which the excess electrons of one have been “borrowed” by the other, forming a bond between them. In water, the elements dissociate, becoming positively and negatively charged “ions”. In brain the most common positive ions are—Sodium (Na^+) and Potassium (K^+).

Recapitulating the fact that neuron communicates by converting chemical (neurotransmitter) presence into electrical impulses, we shall understand what happens to cause an action potential. When a neurotransmitter signal is received from a neighboring cell, the cell membrane allows sodium (Na^+) ions inside and makes the cell more positive (i.e., ions which tend to lose electrons). The accumulated Na^+ now changes the cell to such a point (threshold) that specialized (Na^+) gates open, letting huge amount of sodium ions flood in. That region of cell becomes more positive and depolarizes the neighboring region in the cell until it too opens the gates and depolarizes. The wave of depolarization spreads along the membrane, making the next part of the cell leaky for depolarizing and it becomes contagious and gradually all the cell depolarizes. In this way, the electrical current spreads down the cell membrane, never becoming weaker. This is action potential. At some point, the sodium channels automatically close and no more sodium flows in. The positively charged membrane causes potassium channels to open and potassium leaves the cell. As potassium ions leave, the cell membrane returns to normal, which is negative on the inside and positive on the outside. Upon reaching the original state, the potassium channels shut down. A sodium-potassium pump restores the normal ion balance across the membrane.

2. ACTION POTENTIAL



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STUDENT'S SECTION:

THE DISABILITY ADJUSTED LIFE YEAR (DALY)

The Disability Adjusted Life Year (DALY) was first introduced by the World Bank in 1993 as one component of a methodology designed by researchers at the Harvard School of Public Health to measure the “Global Burden of Disease.” The DALY which is a standardized measure of the years of life lost due to premature death, and years of life lived with a disability of specified severity and duration, was intended by its authors to be “a unit used for measuring both the global burden of disease and the effectiveness of health interventions.” In constructing the disability portion of the DALYs, years of life lived with specific

disabilities were assigned values in the following way. An internationally representative group of health professionals (participants) first evaluated all of the diseases contained in the International Classification of Diseases (ICD) and developed a list of the diseases known to cause disability. From this list, twenty two “indicator disabling conditions” were selected. Each indicator disabling condition was then evaluated by the participants and assigned a severity weight between 0,

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representing a state of perfect health, and 1, representing a state equivalent to death.

The indicator disabling conditions were then grouped into

seven disability classes according to their assigned weights. These results, which were “closely matched” in nine additional exercises using the same protocol with different participants, are presented in the Table:

Disability Class	Severity Weight	Indicator Condition
1	0.00-0.02	Vitiligo on face, weight for height less than 2 standard deviations
2	0.02-0.12	Watery diarrhea, severe sore throat, severe anemia
3	0.12-0.24	Radius fracture in stiff cast, infertility, erectile dysfunction, rheumatoid arthritis, angina
4	0.24-0.36	Below-the-knee amputation, deafness
5	0.36-0.50	Rectovaginal fistula, mild mental retardation, Down syndrome
6	0.50-0.70	Unipolar major depression, blindness, paraplegia
7	0.70-1.00	Active psychosis, dementia, severe migraine, quadriplegia

Disability Classes and Severity Weightings for the 22 Indicator Conditions.

According to the authors of the DALYs, the disability severity weights presented were established in the following way. In essence, the weight is set by the number of people with a given condition whose claim on a fixed healthcare budget is equal, in the judgment of the participant, to that of 1,000 healthy people. For example, if the participant judges that 1,000 entirely healthy people would have an equal claim on the resources as 8,000 people with some severe disability, the weight assigned to that particular disability is equal to 1 minus 1,000 divided by 8,000, or 0.875. If 1,000 entirely healthy people were judged to have an equal claim on the resources as 2,000 people with a particular, less severe, disability, the weight assigned would be equal to 1 minus 1,000 divided by 2,000, or 0.5. After weighting the twenty two indicator conditions, the participants assigned weights and classes to the remaining disabling conditions. The disability portion of the DALYs were then obtained by multiplying the severity weights for each condition (adjusted for age of onset, and discounted over time) by their expected durations, which were estimated based on scattered data from community based epidemiological research, knowledge of routine information from health facilities and expert judgment.

Due to this conceptualization and formulation, the DALYs suffer from at least two serious shortcomings:

- 1) they are based on an inadequate definition of disability, and
- 2) their methodology for estimating the relative severity of disabilities is flawed.

Inadequate definition of disability: Unlike the ICIDH-2, which is based on a definition of disablement that recognizes the effects on people with disabilities of complex interactions between impairments, functional abilities and contextual factors, the DALY model of disability is based on the simplistic and inaccurate assumption that disabilities are nothing more or less than the physical outcomes of medical diagnoses. Contextual factors do not play a part in the DALY model. Each specific disabling condition is assumed to always result in a disability of a given severity. Within the DALY model, therefore, there is no mechanism for evaluating the relative merits and benefits of competing disability policies, strategies and interventions because these and all other contextual factors are assumed to be incapable of changing the immutably diminished circumstances of disabled people that are assumed to result solely from their specific disabling conditions.

The methodology for estimating the relative severity of disabilities is flawed: The DALY methodology is based on the assumption that certain health professionals are qualified to assess the levels of severity of disability associated with all medical diagnoses. While many if not most health professionals, particularly those who participated in the DALY research, may be assumed to have had training in disability, and to have had

much higher levels of contact with people with disabilities than the general population, most are not disabled themselves, and none can possibly have had the intimate experience with all types of disabilities required to accurately assess the severity associated with all disabling conditions in all possible contexts. It is, therefore, incorrect to assume that the participants in the DALY research truly understood all of the implications of all of the disabling conditions they examined. The assumption that a given group of primarily, if not exclusively, able bodied healthcare professionals can accurately evaluate the quality of the lives of people with all types of disabilities based solely on their specific medical diagnoses is analogous to assuming that a given group of primarily, if not exclusively, male experts on female biology can accurately evaluate the potential quality of the lives of individual females based solely on their specific female physical characteristics.

Also, due to the significant impact of contextual factors on the severity of any disability, the variation around the mean of any single severity level estimate for any particular disabling condition must be so huge as to rob the estimate of its meaning. For example, paraplegia, which is considered in the DALY system to result in a 50% to 70% decrease in one's quality of life (see Table), may actually produce an even larger decrease in the quality of life of a member of a nomadic tribe where physical prowess and the ability to ambulate are highly valued.

However, paraplegia may produce a much smaller decrease than the DALYs predict in the quality of the life of a Full Professor with an endowed chair at a prestigious university.

The significant impacts of personal and environmental contexts on the qualities of the lives of people with given disabling conditions are an obvious reality ignored in the DALYs. As a result of this omission, the DALY severity weightings are at least dangerously imprecise and arguably meaningless.

NOTE: As we did not receive any write ups for the newsletter, the editor has compiled and written this issue. Our next issue will carry the titles in Professional section: Elements of Psychosocial rehabilitation: series, part-2: emotional reactions to disability; Visitor's section: Brain and Behaviour: The pathology of neuron; and Student's section: Psychological Issues and trends in Rehabilitation studies.

It is pleasure to inform our readers that the Introductory issue has been received by 400 addresses all over India. Please correspond to: rehabilitation.psychologist@gmail.com or The Rehabilitation Psychologist, Shri Lakshmivenkateshwara Nilayam, Vittalwadi, Narayanaguda, Hyderabad-500029, Andhra Pradesh

Errata: Total Solutions is the Learning Center for children with learning difficulties and not for special children (as reported by **Ragesh Nair**, Rehabilitation Psychologist)