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ICF and Mental Functions: applied to Cross Cultural Case Studies of Schizophrenia

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Introduction

The third leading cause of loss of healthy years of life are mental health disorders which disrupt individuals' capacity to participate and function in society. Mental health disorders also diminish their quality of life, economic status, and well-being (World Health Organization, 2002). In recognition of the overwhelming cost and suffering associated with mental illness that reaches beyond psychopathology, there has been a shift to measuring the outcomes of mental health interventions in terms of quality of psychosocial functioning and life, rather than the remission of symptoms (Juckel et al., 2008b). This article uses three case studies of individuals with mental health disorders to demonstrate the applicability of the International Classification of Functioning, Disability, and Health (ICF) as a conceptual framework and a classification system. The use of ICF enables practitioners to evaluate, and interpret chronic mental health disorders within different populations and at varying levels of disabilities and function (Ewert et al., 2004). The ICF classification system is applied to mental functions of the three individuals with schizophrenia who live in three different countries. The universality of the ICF framework captures the uniqueness in *functioning and disability* of these individuals because each is interpreted in the context of his environmental and personal factors such as dispositions, experiences, healthcare systems, culture, economic status, and availability of resources rather, than their psychopathology and mental function impairments associated with schizophrenia.

The International Classification of Functioning, Disability, and Health

Diagnosis and *disability* are distinct constructs. The term *disability* is widely misperceived as a reflection of an *illness* or a person's medical diagnosis, whereas in reality human beings accomplish their life roles through the interaction of the body's anatomical structures and physiological and psychological function, the environment, personal factors and their participation in activities. The World Health Organization – ICF framework represents these components and domains and their respective interactions to determine an individual's function

and disability. Using a bio-psychosocial perspective with a uniform framework and language the ICF can be used to describe health and health-related states concerning human functioning and the restrictions in activities and participation due to impairments in body structures and functions. The ICF classification system differs to diagnostic systems, such as the International Classification of Diseases (ICD-10) and the Diagnostic and Statistical Manual for the Classification of Mental Disorders (DSM-IV TR). These systems provide universal definitions of mental health disorders based predominantly on a biomedical model of an individual's behavioral signs and the nature and frequency of symptoms (Baron & Linden, 2008; WHO, 2007; American Psychiatric Association, 2000).

The ICF incorporates three interrelated concepts and organizes information from a two-part perspective: I) *Functioning and Disability;* and II) *Contextual Factors*. *Functioning and Disability* is comprised of the two components: *Body Functions and Structures*; and *Activity and Participation,* whereas the *Contextual Factors* includes the individual's *Environment and Personal Factors* (WHO, 2001a). Functioning is defined conceptually as the integrity of body functions and body structures to perform tasks (*activity*) in life situations (*participation*). Disability refers to a negative outcome of a health condition or disorder that compromises an individual's integrity to *participate* in life situations (WHO, 2001a). In conceptualizing functioning and disability in this way, the ICF construes the relationships among the components of the body, environment, and personal domains as bidirectional (Stucki, Ewert, & Cieza, 2002). To elucidate this dynamic relationship, the ICF employs two constructs: *capacity* and *performance*. *Capacity* is a person's ability to execute tasks in a standard environment such as the therapy setting. Whereas, *performance* is the actual performance of a person executing tasks in his or her natural environment. Two individuals with the same diagnosis and severity of disorder might have the same capacity to perform tasks when performing in a controlled environment, but their *performance* might differ significantly in their natural environment due to their personal factors and their environment's characteristics.

One domain of the ICF body functions is *Mental Functions*. These are the psycho-physiological functions that encompass thought, intellect, information processing, emotions, and behaviors, all of which are critical to daily functioning. The ICF divides mental functions into two categories: *global mental functions,* which are essentially, consciousness; energy and drive; and *specific mental functions* which are cognition and the role of cognition in behavior and communication (WHO, 2001a).

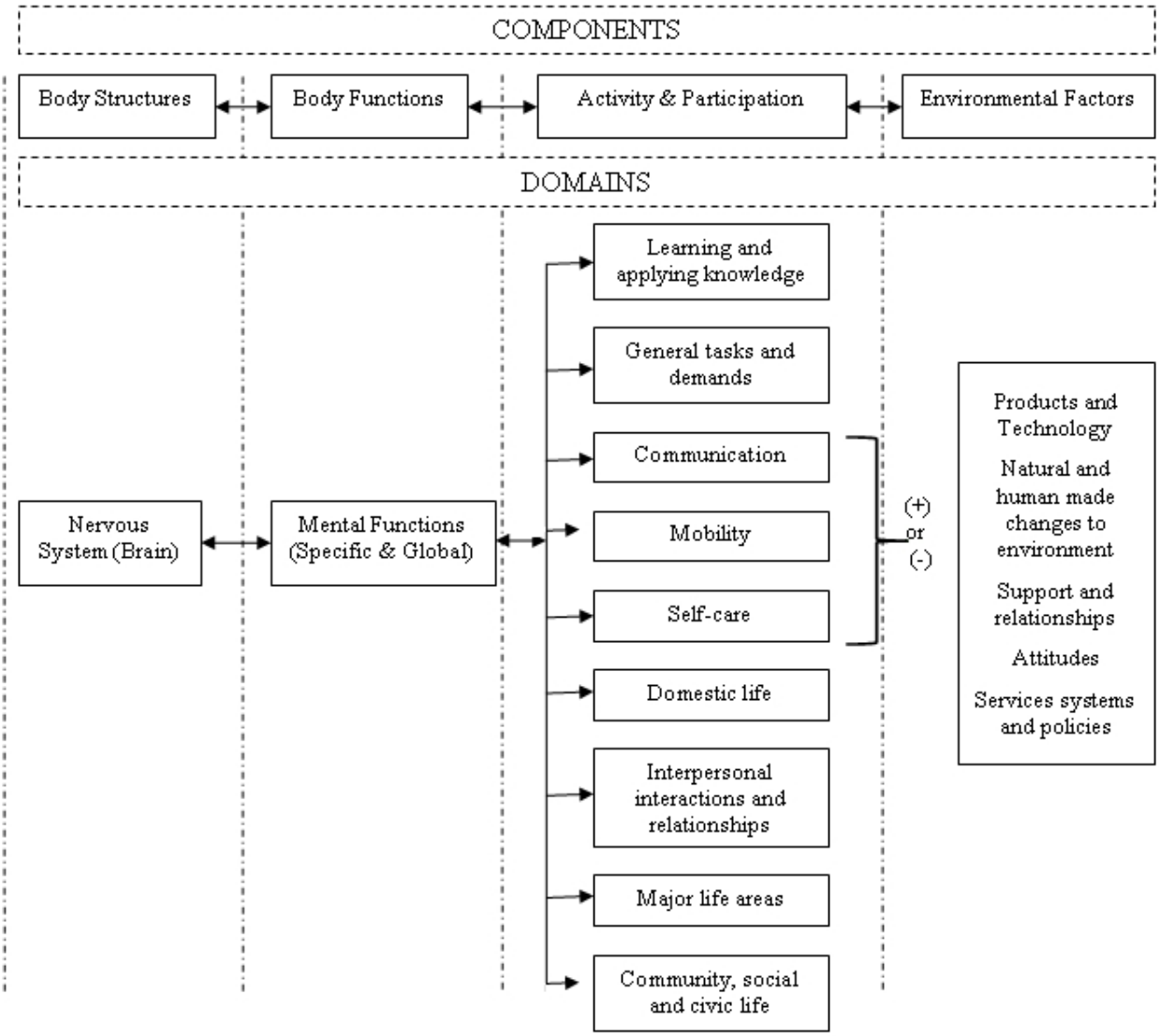

Figure 1: The inter-relationship of the ICF mental function domain with activity, participation, and environmental factors

As seen in Figure 1, mental functions are integral to all *activity and participation*. For example, mental functions (i.e., thought) are critical to the activity of communication, as is the function that generates ideas, notions, and interprets emotions that are expressed through multiple forms (verbal, non-verbal, electronic) in multiple contexts (formal, informal, work, education and personal relationships). Likewise, activity and participation are the product of mental functions, while interaction of mental functions and contextual factors, support and shape, the *relationships*, *attitudes*, and *access to service systems* that influence the participation of people with mental illness.

Classifying individuals using the ICF framework can show the breadth and complexity of ICF to portray holistically functioning and well-being. This article illustrates the applicability of the ICF framework using the *Mental Function* domain to explicate the roles of impairment of a body function and structures associated with a mental health disorder, and demonstrate how personal

and environmental factors play an integral role in a person's functioning and disability, which is observed in person's activity and participation components.

Schizophrenia

Schizophrenia is a chronic neuropsychiatric disorder that affects approximately 25 million people globally (WHO, 2002). There are five distinctive sub-types that share some similar symptoms and to some extent, all individuals with schizophrenia, have poor psychosocial adjustment, acute psychotic episodes, and functional and occupational disabilities (Rossler, Salize, van Os, Riecher-Rossler, 2005). However, the subtypes also vary in the clinical presentation, treatment responses, course, and prognosis (APA, 2000). For example, the predominant characteristics that distinguish paranoid-type schizophrenia are delusions that are persistent false beliefs about persecution or mistreatment, and auditory hallucinations. This auditory perceptual disturbance includes voices people hear that tend to be hypercritical and are negative comments about the person or evoke suspicion of others. In paranoid schizophrenia *specific mental functions* such as executive thinking and expression of emotions are relatively unaffected. In contrast, disorganized-type schizophrenia is characterized by disorganized thinking that is observed in a person's incoherent speech or impoverished thoughts and in his or her difficulty performing everyday tasks due to chronically impaired mental functions. Difficulty understanding and expressing emotions is common and this significantly disrupts social participation.

The symptoms of schizophrenia which are defined as negative and positive, are predominantly disturbances or impairments of *mental function* and associated with difficulty performing general and higher-order cognitive tasks such as attention, insight, judgment, abstract thinking, problem solving, comprehension, and the retention of complex verbal and non-verbal material. Positive symptoms are associated mostly with acute psychoses and are the symptoms most often portrayed in the media as characteristic of schizophrenia. They are perceptual disturbances (e.g., hallucinations) disordered thinking (delusions, incoherent or meaningless speech), and behaviors (e.g., agitation or unusual movement patterns).

While both positive and negative symptoms affect quality of life, negative symptoms are the most debilitating and chronic (Juckel & Morosini, 2008). The severity of negative symptoms is significantly associated with disturbances in executive functioning, memory, attention and motor functioning that affects a person's adaptability (González-Blanch et al, 2006). Even individuals with schizophrenia who scored within the normal range for intellect on neuropsychological tests; they tend to function and demonstrate adaptability below their estimated intellectual level (Kraus & Keefe 2007).

Negative symptoms also include difficulty in experiencing pleasure, a lack of initiative and volition to participate in everyday life, limited emotional expressiveness, monotonic or limited speech, and/or a seemingly lack of interest in other people, events, or life in general. The difficulties in recognizing and expressing emotions non-verbally, comprehending and interpreting facial expressions and using nuanced tone and pace to express emotions when speaking are correlated significantly with decreased occupational functioning (Matthew & Barch, 2010). Overall, negative symptoms are correlated with poor occupational and psychosocial functioning (e.g., unemployment, few social relationships), and low probability of

living independently and being in a stable relationship (Hofer et al., 2006; McCurk & Melter, 2000). The effects of negative symptoms are additionally debilitating because there is little evidence of effective treatment for these symptoms (Erhart, Marder, & Carpenter, 2006).

International Classification of Functioning, Disability and Health and Schizophrenia

A multidisciplinary treatment approach for schizophrenia integrates psychopathologic symptoms, patient's characteristics, and the family's experience to offer a comprehensive continuum of care (Dassori, Chiles, & Swenson-Britt, 2000). The guidelines for best practice advocate patient-centered psychosocial/psychiatric rehabilitation programs combined with pharmacological treatment (Lauriello, Lenroot, & Bustillo, 2003). However, a successful integrated approach to schizophrenia requires that a practitioner have knowledge of the client/patient's social and personal factors, occupational performance and capacity, and environmental factors in order to promote a client's full participation in society at his or her *capacity* level (Schmid, Neuner, Cording, & Spiessl, 2006; Lambert & Naber 2004).

A significant challenge in achieving this comprehensive approach has been a lack of a universal, workable framework to document and interpret the complex personal and environmental factors in order to understand a client's function abilities and disabilities. Some psychometric and performance measures (e.g., the Negative and Positive Symptoms Assessment Scales, and the Brief Psychiatric Rating Scale,) are bio-medically oriented, and predominately measure symptom reduction to determine medication effectiveness. Other measures are more functionally oriented (e.g., the Global Assessment of Function, the Functional Independence Measure, the Routine Task Inventory, and the Assessment of Motor and Process Skills) and are oriented to the health and functioning of the person. The ICF represents a resolution of the divergence between the medical model approach towards disability (i.e., as a problem of the person and caused by pathology) and the social model view of disability as a social construct rather than an attribute of the person (Ustun, Bickenbach, Kostanjsek & Scheider, 2003). The ICF framework offers a middle ground that recognizes the bio-psychosocial dimensions of disability. It organizes individual data and the findings of diverse measures to capture the multidimensionality of a person with mental illness. It also provides a common language for describing the functioning of individuals with mental health disorders across various settings (Tenorio- Martinez, del Carmen Lara-Muñoz, Medina-Mora 2009). The ICF model also differentiates between the disability arising from mental health disorders and those that are due to environmental factors, including society's discrimination of persons with mental disorders (Kennedy 2006).

Several studies have demonstrated the use of the ICF as an explanatory model and/or conceptual organizer of mental health disorders (Sanderson, Nicholson, Graves, Tiles & Oldenburg, 2008; Wormgoor et al, 2006; Kuijer, et al, 2005; Arthanat, Nochajski & Stone, 2004; Chopra, Couper, & Herrman, 2002). Furthermore, the overarching principles of the ICF are congruent with the philosophy and approaches of psychiatric rehabilitation models that focus on achieving functioning through overcoming disabling impairments at the activity and participation level or through adaptation of environments to support functioning rather than symptom reduction (Reed et al., 2009).

Ewert and colleagues (2004) wrote that the ICF model allows mental health care practitioners "to describe the whole health experience including environmental factors (p.22). The figure below illustrates the key domains within the ICF components that are critical to organizing information pertinent to schizophrenia.

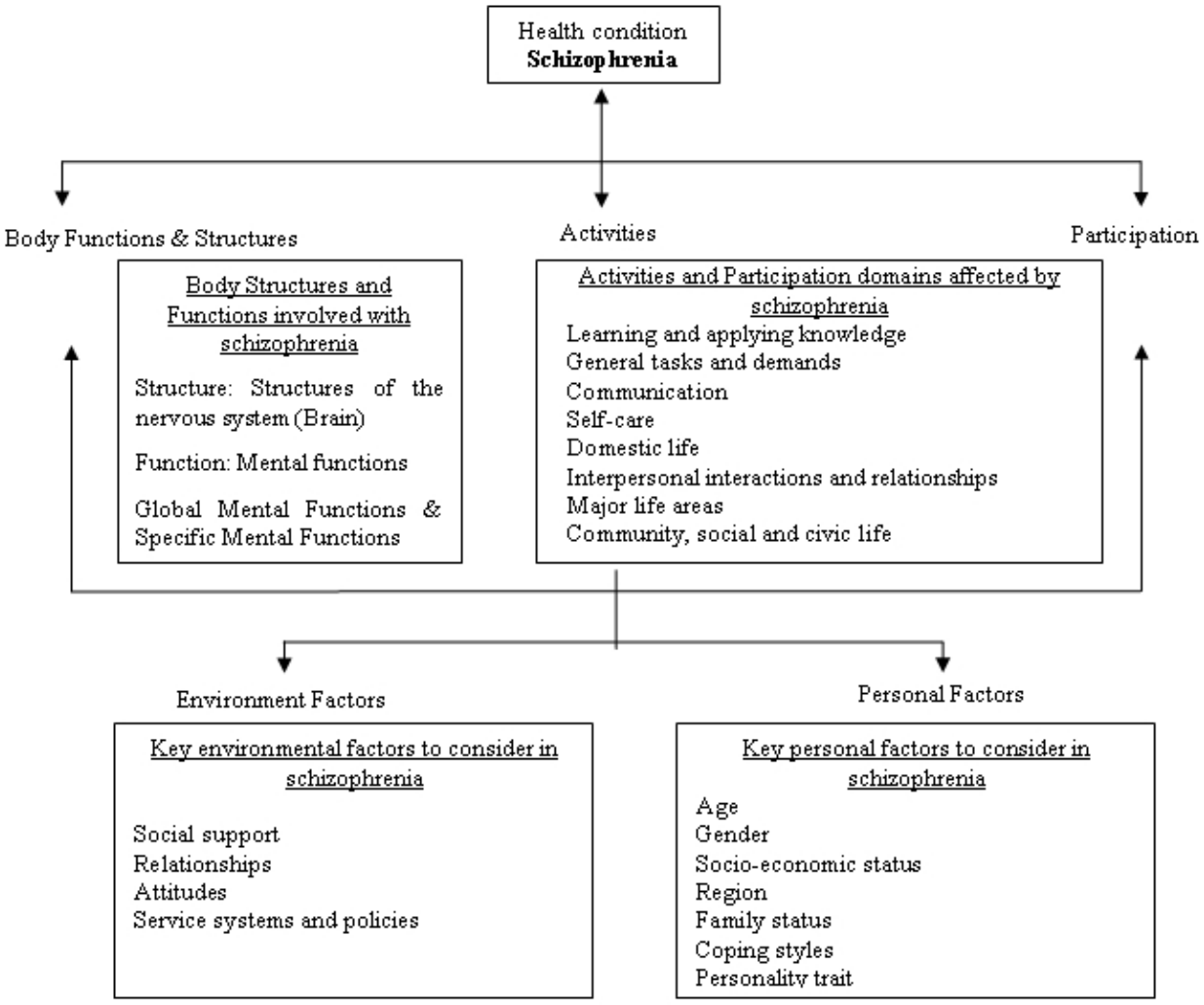

Figure 2: The International Classification of Functioning Disability and Health Model (WHO, 2001) Adapted to illustrate the model applied to a person with Schizophrenia with impairments of mental functions

In the following section, we present three hypothetical profiles of young males with schizophrenia and organize them using the ICF framework. These profiles have been developed based on review of global literature on schizophrenia including cultural, socio-economic, and health care systems pertinent to the respective regions. The goal is to demonstrate how the framework assists a healthcare practitioner to interpret performance, personal and environment factors, and the interaction between the domains to represent the uniqueness of each person.

Case Studies

The following case studies are descriptions of three 24-year-old males with a diagnosis of disorganized type schizophrenia. They each live in a different part of the world (US, Canada, and India), are from middle-class families, and share a similar clinical history. All presented with *prodromal* (pre-morbid) symptoms around the age 16 years. Prodrome refers to a constellation of symptoms that present at the beginning of the illness and include unexplained sensory phenomenon (e.g., colors or music being brighter or duller), and/or difficulty with thinking and organizing thoughts (Bota, Saguyu, & Stau, 2005). All the three young males in the case studies report that two to three years prior to their first psychotic episode, their performance at school began to deteriorate. They experienced difficulty concentrating, initiating activities, and frequently lost track of time because of daydreaming. They commented that it was increasingly difficult to be around people and they participated less in their activities with friends.

At 19 years old, each was admitted to a psychiatric hospital in an acute psychotic state with *positive* symptoms including extremely disorganized thinking, incoherent speech, and delusions of reference and broadcasting. For example, they described that they believed random events had special significance, such as the TV news having special messages exclusively for them, and that others could hear their thoughts. They experienced auditory hallucinations and difficulty expressing emotions. Each diagnosed with schizophrenia of the disorganized type was prescribed a new generation anti-psychotic medication called Respirodone and discharged from the hospital into the care of their parents (APA, 2000).

They have each intermittently discontinued their medication, and been readmitted to the hospital with acute psychosis. These episodes of psychosis have been associated with further deterioration in functioning. As is the pattern with disorganized schizophrenia, they have negative symptoms that are debilitating and significantly affect psychosocial and occupational functioning.

Cross-cultural Case Studies of three men with Schizophrenia

These case studies are hypothetical. They are composite individuals with predominant patterns and experiences of individuals with schizophrenia as reported in research and survivor narrative. To reflect common experiences of individuals with severe mental health disorders in the three countries, many local sources were consulted e.g., Healthcare practitioners. A source of information for Jason's profile was the National Alliance on Mental Illness 2009 national survey.

The case studies are not a commentary on social, justice, or healthcare systems in the US, Canada or India. Instead, the cross-cultural perspective illustrates the universality and utility of the ICF.

Jason lives in Boston, Mass., graduated from high school through an alternative program and he is unemployed. During a recent incident, the police responded to a disturbance at his parent's home where they found him incoherent, resulting in an assault of one of the officers. This was not Jason's first altercation with the police and he was taken into custody. It is likely that he will go to prison for the assault unless he is referred to the mental health court where his condition will be taken into consideration during sentencing.

In the past, Jason worked sporadically on construction sites, but he has not been able to keep a job. At present, he receives Supplementary Security Income of approximately $650.00 per month, and his brother and parents sometimes help him financially. Since he cannot afford to live independently, and his identified place of residence is his parents' home. His lack of insight, recurrent acute episodes, substance abuse, and marginal functioning strains his family relationships. Jason's parents attend the family-to-family classes run by NAMI (a consumer advocacy organization), but Jason refuses to be involved with the group. Periodically, Jason lives on the street, uses homeless shelters, and has contact with a program for street youth run by a non-profit organization.

Medicaid covers Jason's healthcare, but his contact with his healthcare providers is sporadic. When he becomes psychotic or his positive symptoms increase, he typically goes to an emergency or walk-in health care centre. Therefore, his care lacks continuity, such as a case manager and psychiatrist who monitors his medication and care. This lack of oversight contributes to poor adherence to medication and poor follow up with outpatient and rehabilitation services.

Dave lives in Toronto, Canada, in subsidized housing. He completed high school, but his illness has interfered with him successfully pursuing tertiary education. His work history is erratic and he has worked mostly in manual warehouse jobs packing boxes and loading trucks as well as a few cleaning maintenance contracts.

After his first admission to hospital, Dave received services from the provincial early intervention for psychosis (EIP) program, which focuses on the transitional and health needs of youth and young adults with early psychosis. Through the EIP, he continues to receive services such as case management, supported education and occupational therapy, outpatient psychiatric follow-up, and the opportunity to attend a peer support group. Dave is reluctant to accept his diagnosis and due to his lack of insight, he periodically stops his medication and discontinues his EIP services. However, after each readmission to hospital, he reconnects with his EIP services. Upon the third and most recent admission to hospital, he has been identified as high risk and was registered with an assertive community outreach program.

Dave has few friends; he would say he mostly just "hooks up" with people. He is attempting to continue with his education by studying part-time through a community based non-profit academic upgrading program in order to transition to college. His attendance is inconsistent, is impatient with his Learning Coach, and his progress is limited. He is reluctant to move on to vocational rehabilitation services since he believes he can complete his community based academic upgrading program and obtain his Assistant Cook Extended Training (ACET) George Brown College certificate.

Recently he transitioned from his parent's health insurance to begin receiving a provincial government disability pension of approximately $900/month with medical supplements to cover medications and other associated health benefits. His parents continue to be involved in his life, but at times, his relationship with them is strained. His family attends a family support–psycho-education group run by the schizophrenia fellowship, a nonprofit consumer organization.

Deepak lives with his parents in Delhi. He completed his high school and began a computer science program at the Indian Institute of Technology. During his first year, Deepak had his second psychotic episode, which he attributes to the intensity of his studies, and stress of his parents' overly high expectations. His mental status subsequently worsened and he dropped out of University.

Deepak's parents admitted him to a private psychiatric hospital out of state. His mother's brother, who had committed suicide, had spent time at this Hospital. After being stabilized with medication, Deepak returned home and received outpatient services at a local hospital. Since then he has worked periodically at a small company owned by his uncle.

He is financially and emotionally dependent on his retired parents, and mother organizes his daily routines. He attends a part-time Diploma program at a Technical College for computer studies and his brother pays his tuition. Deepak has lost all connections with his college friends. He still has some contact with his childhood friends in the neighborhood, but mostly his parents initiate this through close family friends. He enjoys reading, playing chess with his father, and watching cricket. He only attends immediate family gatherings, since his parents are ambivalent about his circumstances and illness and wish to keep his problems private.

An extended family friend organized his arranged marriage, and the engagement was celebrated in a public ceremony. However, the bride's family called off the wedding after two-years because of Deepak's illness and family history of mental illness. Deepak relapsed soon after, and was admitted to the Hospital supported by the National Mental Health Program. There is a plan for him to be discharged into the care of his parents, unless they decide to arrange private rehabilitation services.

Hypothetically, these three young men's schizophrenia has followed the same course, but their life experiences of navigating life with the disorder have been distinctly different. The ICF framework can provide an explanatory model that documents and interprets their lives with schizophrenia in order to understand their disabilities and plan individualized interventions. The framework conceptually explains their performance relative to their *activities* and *participation* by identifying the domains affected and recognizing the interaction of environmental and personal factors and body structure and functions that contribute to their disabilities or support their functioning. This multi-faceted understanding is essential for determining and monitoring effective interventions.

Since cognitive impairment significantly affects activities and participation for persons with disorganized schizophrenia, we choose to focus on the mental functions domain of the ICF body function and structure components. We assume all three young men have the same psychopathology and mental function involvement. We then show using the ICF, the differences in functioning and the respective disabilities of each young man can be explained by examining their environmental (socio-economic and cultural) and personal factors.

In the following tables, we present the three case studies. It is assumed that they are stabilized with medication and are primarily presenting with chronic negative symptoms of schizophrenia.

ICF Classification with coding

The tables below classify Body Function and Structures related to Mental Function. Only selected Activities, Participation, and Environmental and Personal Factors are included to illustrate how the ICF can identify and explain function and disabilities. The intention is not to provide an exhaustive list of the domains that might be affected in a person with disorganized schizophrenia. The assignment of the ICF qualifiers is used to document the severities of impairments in body functions and structures and difficulties with activities and participations. The assignment of qualifiers to code the extent of the problem is quantified on the percentage limitation within an ICF component (WHO, 2001). The extent or magnitude of problem within each ICF component and corresponding domains is indicated based on: xxx.0- No problem (0-4%); xxx.1- Mild problem (5-24%); xxx.2-Moderate problem (25-49 %);, xxx.3-Severe problem (50-95%), and xxx.4-Complete problem (96-100%). Ongoing research is needed to develop assessment procedures to standardize the use of the ICF qualifiers (WHO, 2001). For the purpose of this paper, the intention of the assignment of qualifiers in this paper is not to rank the health or health related state of the three individuals, but rather, to highlight the differences in their functioning and exemplified qualifier system of the ICF components.

Table 1: Application of the ICF coding for persons with chronic mental health disorders: Exemplar disorder Disorganized Schizophrenia: Body Functions and Structures - Mental Functions

Component: Body Function -Mental Functions *Non-psychotic status: experiencing negative and some residual positive symptoms*			
	Jason - USA	**Dave – Canada**	**Deepak - India**
Chapter 1: Mental Functions	**INTERPRETATION**		
Global Mental Functions			
Global Psychosocial b122.3	Severe impairment Due to an inability to interpret social cues and recognize emotional content in social interactions, disrupted development of interpersonal skills that are involved in forming and maintaining social relationships and difficulty with conversing due to poverty of thought and disorganized thinking.		
Temperament and Personality b126.2 *Psychic Stability* *Openness to experience* *Optimism* *Confidence*	Moderate impairment Psychic stability - easily stressed which increases positive symptoms, can present as irritability and depressive symptoms Openness and Optimism – emotionally inexpressive, lacks mental agility so new situations can cause stress. Limits exposure to new experiences and tentative about future Confidence and self-concept, which are undermined by lack of success in age related tasks such as higher education and the discrepancy between ability and performance.		
Energy and Drive b130.3 *Energy level* *Motivation*	Severe impairment- Negative symptom of schizophrenia include low energy levels, apathy, difficulty imitating activities, intrinsic motivation to engage in activities low.		
Sleep b134.2 *Amount of sleep* *Ability to sleep*	Moderate impairment - Poor sleep routines and lethargy		
Specific Mental Functions			
Attention Functions b140.2 *Sustaining, shifting, dividing and sharing attention*	Moderate impairment Reduced attention in all areas, difficulty concentrating on tasks, easily distracted by external and internal stimuli.		
Memory Functions b144.1	Mild impairment		

Short and long-term Retrieval	Affected by poor concentration therefore difficulty with both storing and retrieval, with recall fluctuating with severity of symptoms and motivation
Psychomotor Functions b147.1 *Psychomotor control*	Mild- impairment Emotional lability mixed with apathy.
Emotional Functions b152.2 *Appropriateness of emotions Regulation of emotions Range of emotions*	Moderate impairment Symptoms include flatten or blunt affect. Limited range of emotions expressed.
Perceptual Functions b156.1 *Auditory perception*	Mild impairment Auditory hallucinations especially when stressed
Thought Functions b160.2 *Pace, content, & form of thought*	Moderate impairment Disorganized thinking such as tangential thinking, poverty of thought and an increased likelihood of delusional thinking when stressed
Higher Level Cognitive Functions - b164.1 *Abstraction Organization and planning Time management Cognitive flexibility Insight Judgment- Problem solving*	Mild impairment Higher level functions leads to difficulties in discriminating between and evaluating different options, identifying, analyzing and integrating incongruent or conflicting information into solution, all of which affects problem-solving skills, making choice and organizing self. Poor insight is associated with poor functional outcomes for individuals with schizophrenia. Mild impairment in judgment and insight can result in refusal of medication, awareness, and understanding of one's behavior and its affect on outcomes and relationships with others.
Mental Functions of Language b167.2 *Reception of sign language Expression of language Expression of spoken language, Expression of sign language*	Moderate impairment This is a significant negative symptom associated with schizophrenia. facial expression often reflect flatten affect and therefore do not convey understand or emotions which can cause miscommunication Confusion due to poor ability to interpret communication (non-verbal and social cues) can cause distress or contribute to social isolation. Mild impairment in verbal fluency associated with disorganized thinking, poverty of thought and difficulty with higher level cognitive functions

Component: Body Structure
Chapter 1: Structures of the nervous system

	Jason - USA	**Dave - Canada**	**Deepak – India**
Structure of the brain- s110 No impairment severity assigned	**Interpretation**		
Limbic forebrain & basal ganglia	Most neuro-pathological studies consistently report findings of abnormalities of the limbic forebrain, (especially the amygdala and the hippocampus), and the basal ganglia (including the caudate, nucleus accumbens, and olfactory tubercle).		
Ventricles	Studies report evidence of enlarged ventricles (more common in males) and enlarged cortical sulci in large number of people with schizophrenia at the onset of illness. This does not progress over the course of the illness. Ventricular enlargement correlates with larger numbers of hospitalizations.		
Temporal brain	Studies of temporary lobes have detected difference in gray matter. Most such studies have been consistent in finding loss of temporal lobe volume and loss of temporal lobe gray matter volume. Importantly, evidence from MRI studies suggest that there are not progressive degenerative changes in the gray matter		
Type 2 (called D2) receptors in the brain	There is a hypothesis that the dopamine systems of the brain are over active in schizophrenia. This hypothesis is related to effectiveness of medications that block dopamine brain receptors and reduce psychotic symptoms.		

Component: Activity and Participation **Capacity:** ability it execute task in standard environment **Performance:** performance level in current environment(s)			
	Jason -USA	**Dave - Canada**	**Deepak – India**
Chapter 2 General Tasks & Demands	**Performance:** **Jason, Dave, and Deepak level of performance in their current environment.**		
Carrying out daily routines d230 *Managing daily routines* *Completing daily routines* *Managing one's own activity level*	Moderate difficulty d230.2 Performance fluctuates due to negative symptoms such as disorganized behaviors, fluctuating affect and unstable living environment does not provide structure	Mild difficulty d230.1 Performance fluctuates due to negative symptoms such as motivation to take care of his personal environment. Structured environment supports routines	Moderately difficulty d230.2 He has not had opportunities to learn and develop these skills (e.g., mother determines daily schedule)
Handling Stress and other psychological demands *Handling stress* *Handling Crisis*	Severe difficulty d240.3 Poor self-regulation of emotions such as anger and aggression cause him to manage conflict situation poorly. Unstable environment and lack of therapy to learn adaptive skills	Mild difficulty d240.2 With support system and rehabilitative services such as psycho-education and assertiveness community training Dave has developed adaptive skills to handle some stressor.	Moderately difficulty d240.2 Family manages Deepak's stressors making him vulnerable due to lack of adaptive skills to independently handle stress
Chapter 3: Communication			
Conversation & use of communication Speaking Producing non verbal messages *Body language*	Mild to moderate d350 difficulty depending on social demands Mild difficulty d330 Symptoms such as poverty of thought and flat affect are reflected in speech Mild difficulty d335 Psychomotor patterns and lack of personal awareness hinders fluidity of nonverbal expression	Mild to moderate difficulty d350 depending on social demands Mild difficulty d330 Symptoms such as poverty of thought and flat affect are reflected in speech Mild difficulty d335 Psychomotor patterns and lack of personal awareness hinder fluid nonverbal expression	Mild to moderate d350 difficulty depending on social demands Mild difficulty d330 Symptoms such as poverty of thought and flat affect are reflected in speech Mild difficulty d335 Psychomotor patterns and lack of personal awareness hinder fluid nonverbal expression
Chapter 6: Domestic Life			
Acquisitions of necessities d610 –d629 *Place to live* *Goods and services* Doing Tasks d630-649 *Preparing meals*	Moderate difficulty d610.2 No subsidized housing, unstable employment and family support variable Mild difficulty d620.1 Benefit covers basic needs and able to navigate community for daily necessities Mild difficulty d630.1 Simple meals prepared but not necessarily healthy or consistent. Lack of skills and	Mild difficulty d610.1 Subsidized housing, and family support variable Mild difficulty d620.1 Benefit covers basic needs and able to navigate community for daily necessities Mild difficulty d630.1 Simple meals prepared but not necessarily healthy or consistent. Lack of skills and	No Difficulties d610.0 No applicable because family provides all housing needs Mild difficulty d620.1 Capable but few opportunities to use skills in this domain No difficulty d630.0 Capable but no expectation as mother completes these tasks.

	practice due to lack of typical learning experiences. Moderate difficulty d630.2 Due to cognitive difficulties, the tasks and activities demands of complex meals require significant supervision.	practice due to lack of typical learning experiences. Moderate difficulty d630.2 Due to cognitive difficulties, the tasks and activities demands of complex meals require significant supervision.	
Chapter 7: Interpersonal interactions and relationships			
General interpersonal interactions d710-729 *Basic interpersonal Relations*	Moderate difficulty d710.2 Inability to recognize social cues, and respond appropriately and difficulty appreciating and recognizing other expressed emotions	Moderate difficulty 710.2 Inability to recognize social cues, and respond appropriately and difficulty appreciating and recognizing other expressed emotions	Moderate difficulty d710.2 Inability to recognize social cues, and respond appropriately and difficulty appreciating and recognizing other expressed emotions
Family relationships d760	Moderate difficulty d710.2 Family relationship strained, Jason is combative when psychotic and has a history of family aggression. Inability to express emotions' and problem solve limits meaningful reciprocity in family relationship	Mild difficulty d710.2 Family supportive, but behaviors associated with illness have caused stress within family relationships. Inability to express emotions' and problem solve limits meaningful reciprocity in family relationship	Mild difficulty d760.1 High expressed emotion, over dependence and family limit Inability to express emotions' and problem solve limits meaningful reciprocity in family relationship
Chapter 8: Major Life Areas			
Education d810-d839 Higher education d830	Complete difficulty d830.4 Lacks ability to sustain academic study due to cognitive symptoms and lack of educational and financial support	Moderate difficulty d830.2 Currently engaged in a part-time educational program with support, but erratic attendance and negative symptoms have caused poor performance	Mild Difficulty d830.1 Is motivated to complete his technical diploma, but currently taken time off due to his relapse. Family and education system support on-going education
Work and employment d840-d859 Acquiring, keeping and terminating a job d845	Moderate difficulty d845.2 Finds competitive manual employment but health status and social skills make maintaining employment challenging At this time there is a lack of rehabilitative interventions to improve work performance and illness management	Mild difficulty d845.1 Supportive employment and training provided through social services (early intervention program). However, health status and lack of education and provocation skills prevent him from succeeding in open employment. Skill likely to improve with coaching and skill development programming	Mild difficulty d845.1 Supportive employment with family However, health status and lack of education and provocation skills prevent him from succeeding in open employment. Skill level is unlikely to improve due to avol,ition and lack of expectations in work environment
Chapter 9: Community, Social and Civic life			
Recreation and leisure d920	Moderate difficulty d920.2 Lack of discretionary income combined with mental functions impairment such as avolition limits	Moderate difficulty d920.2 Lack of discretionary income combined with mental functions impairment such as avolition limits	Mild difficulty d920.1 Lack of discretionary income combined with mental functions impairment such as avolition limits socializing

	socializing and leisure pursuits Social stigma hinders inclusion in community activities	socializing and leisure pursuits Social stigma hinders inclusion in community activities, some social opportunities facilitated through therapy programming	and leisure pursuits. However, family include and initiate leisure and socializing opportunities for him Social stigma hinders inclusion in community activities

Component: Environmental Factors

Environmental factors are quantified using a positive and negative scale to indicate the extent to which environment acts as a facilitator or barrier. The barrier scale range is -0 (No barrier) to -4 (Complete barrier) and scale for the environment as facilitator has a range from + 1 (No facilitator) to +4 Complete facilitator).

	Jason , USA	**Dave, Canada**	**Deepak, India**
Chapter 3: Support and Relationships			
Immediate Family e310	Mild Facilitator e310+1 He lives with parents sometimes. Brother provides financial assistance. Parents attend advocacy – support group.	Moderate facilitation e310+2 Family supportive e.g., provided health insurance and financial assistance as well as emotional support Parents actively involved in his life. Manage stress times as family	Substantial Facilitator e310.+3 Lives with parents who are in charge of care and day-to-day needs Moderate Barrier e310.2 Family over protective and support dependency. High expressed emotion in family
Extended Family e315	Not known	Not known	Mild facilitation e315.1 Uncle provides employment. Familial obligations results in support.
Friends e320	Mild Barrier e320.1 Socially isolated with no identified friends	Mild Facilitator e320.+1 Has a few friends he associates with	Mild Facilitator e320.+1 Stays connected to his childhood friends
Acquaintance, peers, colleagues, neighbors and community members e325	Moderate barrier e325.2 Socially isolated with no identified social network	Mild barrier e325.1 Has opportunity to socialize with friends in the education program, but cannot sustain friendship because of his erratic attendance and lack of initiative in social relationships	Moderate barrier e315.2 Societal stigma attributed to his illness has distanced him from his peers and community at large
Chapter 4: Attitudes			
Individual attitudes of immediate family members e410	Mild barrier e410.1 Have difficulty manage his behaviors and proactively supporting his recovery Mild facilitator e410+1 Participate in mental health support organizations – open to learning about illness	Mild facilitator e410+1 Participate in mental health support organizations – open to learning about illness	Moderate Barrier e410.2 Embarrassed by son's mental illness, therefore do not access support outside family
Individual attitudes of extended family e415	Not known	Not known	Mild barrier e415.1 Societal stigma attributed to his illness has distanced him

			from his extended relatives
Individual attitudes of friends e420.1	Mild barrier e420.1 Stigmatizing attitudes decreases social acceptance among peer group	Mild barrier e420.1 Stigmatizing attitudes decreases social acceptance among peer group	Mild barrier e420.1 Stigmatizing attitudes decreases social acceptance among peer group
Individual attitudes of Acquaintance, peers, colleagues, neighbors and community members e425.2	Moderate barrier e425.2 Situation with police escalated resulting in him assaulting an officer. Limited public awareness and training in responding to clients with mental illness Stigmatizing attitudes results in discrimination in employment, housing, and education.	Moderate barrier e425.2 Stigmatizing attitudes results in discrimination in employment, housing, and education	Severe barrier e425.3 Stigmatizing attitudes results in discrimination in employment, housing, and education
Chapter 5: Services, Systems & Policies			
Housing services, systems and polices e525	Moderate barrier e525.2 Lack of low income housing or group housing for persons with mental health disorders	Mild Facilitator e525 + 1 Group home and housing available and likely to be accessed during the discharge or transitional care planning process.	Moderate Facilitator e525+2 Cultural expectation that the family provide housing. Severe Barrier e525 + 3 No supportive housing or subsidy
Social security services (SSI), systems and polices e570	Mild Barrier e570.1 SSI below Federal Poverty line of single person household, therefore cannot meet basic needs	Mild Barrier e570.1 Social security benefits, but allowance below unofficial poverty line	Severe Barrier e570.3 No disability allowance or social security
Associations and organizational services, system and policies e555	Mild Facilitation e555+1 Non-profit advocacy, education, and support organizations compensates for lack of infrastructure and services for persons with mental health disorders	Mild Facilitation e555+1 Non-profit advocacy, education, and support organizations compensates for lack of infrastructure and services for persons with mental health disorders	Severe Barrier e555.3 No formal advocacy, education, and support organizations
Health services, systems and polices e580	Moderate Barrier e580.2 Lack of mental health services especially community case management Lack of publically funded psychiatric rehabilitation programs Lack of specialized mental health services in correction and prison system Mild Facilitation e525+1 MEDICAID and State Hospital for acute symptom management The Mental Health Parity and Addiction Equity Act of 2008	Substantial facilitator e580+3 Universal Health Care Access to early intervention program and early intervention reduces hopelessness and stigmatization.	Moderate facilitator e580+3 National Mental Health Program for essential services e.g. hospitalization and medications but no therapies
Labor and employment	Moderate Barrier e590.2	Moderate Facilitator e590+2	Moderate Barrier e590.2

services, systems and policies e590	Lack of vocational training and supportive employment opportunities Moderate Facilitator e590+2 American's with Disability Act	National early intervention programs for youth with serious mental health disorders. Support employment programs available, all provincially or federally funded.	Disability Act not utilized No supportive employment or vocational programs

Discussion and Implications

A recent article featured in The New York Times underscored how diagnostic profiling of mental illness is influenced by the dominant forces of western medicine, yet cross-cultural beliefs, attitudes, and support systems attributed to mental illnesses vary vastly across the globe (Watters, 2010). Therefore, viewing mental illness solely based on an individual's psychiatric profile is shortsighted and a pitfall that mental health professionals must avoid. The ICF framework is helpful in that it enables the health care professional to conceptualize the disability associated with schizophrenia on three levels: the body, the person's actions, and the context. It is an integrative and interactive perspective of the functioning and disability (Juckel et al., 2008b; Wormgoor 2006). This is consistent with comprehensive models of treatment, namely the Assertive Community Treatment, the Psychiatric Rehabilitation Model, and the Illness Management and Recovery program, all of which aim to reduce the discrepancy between capacity and performance.

Importantly, the bi--directionality of the relationships among the components of the ICF (Figure 2) guides health care practitioners to examine how a person's function in one domain influences other domains within the same component or other components such as domains within activity and participation (Stucki et al, 2002). Thus, the process that practitioners engage in is threefold.

One, we identify the domains of the activity and participation component that are affected by Jason, Dave, and Deepak's mental structure and function impairments and determine the extent to which these impairments explain their functioning and disabilities. For example, Jason's mental functions, such as his ability to self-regulate his emotions and judge appropriate emotions for situations, affect his performance and capacity in activities and in his participation. His difficulties with executive cognitive functions affect his ability to make sound judgments, problem-solve, and consider consequences, all of which contribute to his limited functioning. This includes his lack of adherence to a medication regime, and his inability to maintain employment or housing. His behaviors have in the past compromised relationships with his family, and periodically resulted in homelessness. This is problematic since due to his poor mental function he lacks awareness to evaluate the risks of homelessness poses to his health and safety. He does not comprehend the increased likelihood of relapse if he does not continue his medication, with the possibility of further cognitive and functional disabilities with each subsequent psychotic episode.

Two, using the ICF, the health care practitioner can explain Jason, Deepak, and Dave dysfunction in performance and the discrepancy between performance and capacity in relation to personal and environmental factors. The constructs of *capacity* and *performance* theoretically are well established within the ICF framework. However the delineation in practice may be

debatable owing to the subjectivity between the client and the practitioner. The use of an ICF Assessment Sheet, such as the one proposed by Rauch, Cieza and Stucki (2008), allows a practitioner to clearly discern the patient's perspective and illustrate the distinctions between capacity and performance in both activities and participation. In other words, in looking at the function and disability profile of the three case studies, Jason, Deepak, and Dave may conceptually have the similar capacity to execute activities in a standard environment. The differences in their actual performance is understood when the contextual aspects and personal perspectives are taken into account. Their participation (performance) is a product of their current environment, and personal factors, which have also been shaped by their respective environments. For example, the environment affords opportunities and experiences that may have enabled them to learn social skills or develop a repertoire of healthy adaptive behavior. Therefore the use of an ICF based goal-driven tool is essential for a practitioner to ascertain the effect of symptoms, personal factors, and environment, and the interaction of all three to understand Jason, Deepak and Dave's limited or disrupted performance. For example, to explain Deepak's performance, we examine environmental and personal factors, and activity and participation, impairments in structure and functions, and the interactions of these component's domains. His impaired mental function, his diminished higher-level thinking, low energy, and poor thought and language function and his limited skills to cope with stressor is a personal factor.

Specifically, an examination of Deepak's environmental *support and relationships domain* illustrates how the ICF framework can assist a practitioner to explain a person's performance beyond the body structure and function impairments. In developing countries such as India, families have predominantly taken the primary lead in the care of individuals with mental illness (Murthy, 2003), and the implications of this cultural phenomenon has been researched from both positive and negative perspectives. Deepak's cultural family centered values and middle class status of his parents and brother *facilitates* his functioning by providing housing and financial support. Deepak will most likely continue to live with his family. He has access to mental health services in a country where there are about 4000 psychiatrists for one billion people (WHO 2001b, Rangawamy & Sujit, 2009), and a supportive work environment within his extended family network. Therefore, unlike Jason, Deepak has many of his essential needs met (e.g., safe housing, work, and healthcare) and his perceived quality of life might conceivable be higher, than Jason's. However, an alternate analysis of his environmental factors reveals that some aspects of this supportive environment can be interpreted to be a *barrier* to him functioning at his capacity. There is a lack of expectations that facilitate him to participate in age related activities and be self-determining for his optimal level of functioning.

The absence of social welfare benefits in India means that Deepak cannot live without his family's support and if it was not available, he might reside in a state funded institution although he has the *capacity* to live in the community. Other barriers in this context might be the stigmatization of mental illness within his social environment. His family is reluctant to have his mental illness known which leads them limit his social interactions to family gatherings and therefore his opportunities to develop social skills and form relationships outside the family are limited. There is also his mother's relationship with him, which reflects the emotional over-involvement seen in families with a member who has schizophrenia (Marom, Munitz, Jones, Weizman, & Hermesh, 2005). This is referred to as expressed emotions, (e.g., hostility, criticism,

or emotional over-involvement) and is a significant contributor to relapse; (Butzlaff & Hooley, 1998; Leff et al., 1987). Family members may perhaps feel guilty that they may have contributed to the illness.

We see the interaction of the ICF components domains coalesces in Deepak his mother's need to 'care' for her him by structuring his routines. This facilitates dependency and negates societal expectations for him to function as a 24-year-old man. Her actions might be interpreted as a response to her experiences with her brother and a sense of culpability for his disorder because mental illness exists in her family. Furthermore, his family's sensibility toward mental illness is heighted society's marginalization of people with mental illness. This is reflected in his family's desire to keep his illness private. These interpretations of the environmental factors further elucidated when they are viewed in relation to Deepak's personal factors and mental function impairments. His passivity, difficulty in initiating activities, his low energy and motivation, and poor ability to self-regulate his stress, all accentuate dependency. Using Deepak as an exemplar, we note here that the component of *personal factors*, although not classified in the ICF, vitally influences the domains within the other components. In this case, Deepak's temperament and personality (b1263), a domain within global mental function, and ability to deal with stress (d240), a domain within activity and participation, is significantly influenced by his family. A practitioner, while planning intervention, needs to take into account the interaction of *personal factors* with all the other components of the ICF.

Third, when the ICF is considered as an integrated whole, it can be used to determine therapy needs, rehabilitation goals, the environmental facilitators that support function, and measure change to assess the effectiveness of pharmacological and therapy interventions. Similarly, the ICF system of functional profiling and intervention targeting makes it a critical tool for identifying and measuring the effectiveness of rehabilitation at an individual and programmatic level (Arthanat et al., 2004; Ustun et al., 2003). Hence, it is through the structure of the ICF that a health care practitioner can fully comprehend Deepak's disabilities and functioning. Then they are in a position to identify the components and domains which the non-pharmacological interventions need to target in order to facilitate functioning using psychiatric rehabilitative approaches that addresses the discrepancy between performance and capacity. Furthermore, it directs the health care practitioners' attention to the functioning ability of a client measured by psychosocial and occupational outcomes. It shifts the emphasis from diagnosis and symptom reduction to comprehensive interventions that address the pervasive disability. An analysis of a person's ICF profile assists practitioners to deduce in which domains interventions should focus. For example, whether skill development is required for improvement in performance or whether changes to a person's environment could reduce the effect of impairment and enhance function or whether both strategies are required. For example, a practitioner could use an ICF profile of Dave to determine whether he has the potential (structure and function domains) to acquire the skills to manage his medication, if yes, an evaluation would determine his activity and participation capacity for this task and assess his current performance. In addition, analysis of his environmental factors would reveal that they would facilitate his success in this activity (e.g., the support of a case manager facilitates adherence to a medication regime and access to medication is facilitated by the universal access to healthcare in Canada). In contrast, the lack of mental healthcare services is a significant barrier to Jason and his capacity to maintaining a medication regime and mental stability. In viewing, the ICF profile of Dave, a practitioner would readily

identify that his personal factors play a significant role in his relapses and his poor performance in his activities and participation. Based on this, he or she might suggest psycho-educational group treatment approach, which addresses understanding and self-management of schizophrenia as an intervention such as the Assertive Community Outreach program.

In summary, the ICF supports a concept of mental health germane to all cultures. Rather than an absence of symptoms, mental health is defined by a person's participation in productive work and social relationships, contribution to his/her community, and an ability to cope with normal life stressors. Even though people with schizophrenia seek to reduce their positive symptoms, the essence of their mental health is their participation in everyday activities, social relationships, employment, and having safe secure housing (Mueser, 2006). The ICF is a tool that enables the practitioner to reach beyond the negative focus of impairments in body functions and structures to evaluate and interpret the complexity and chaos of living with a mental illness, irrespective of setting or culture in order to offer evidence based care that will achieve mental health, reduce disabilities, and enhance function.

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