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A Comparison of Executive Functioning between Patients with Schizophrenia and Bipolar Disorders

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The purpose of the study was to assess the level of executive functioning between two psychiatric disorders; schizophrenia and bipolar. It was hypothesized that executive functioning will be more impaired in patients with schizophrenia as compared to patients with bipolar disorder. The sample comprised of 120 participants; including 60 individuals with schizophrenia and 60 with bipolar disorder. The ages of the participants ranged between 18 to 35 years. In order to collect data the purposive sampling method was used. A demographic information form was used to determine the pre-requisite information and selection criteria for the research. To assess the executive functioning, cognitive symptoms checklist (CSC) was used. The data was collected from different psychiatric hospitals in Karachi city. For the statistical analysis, a t- test was computed to find out the difference between the two groups. Results indicate significant difference between schizophrenia and bipolar disorder patients [$t = 4.059$, $df = 118$, $p < 0.05$]. Moreover mean scores showing more impairment in executive functioning among the schizophrenic patients ($M = 26.05$) as compared to patients with bipolar disorder ($M = 14.17$).

Keywords: Executive functioning, cognitive functioning, schizophrenia, bipolar disorder, cognitive impairment

The present research attempts to find out the difference in executive functioning between individuals with schizophrenia and bipolar disorder. Executive functioning plays an important role to perform daily functioning. Several researches focus on this area for better diagnosis. Nowadays, psychiatrists and psychologists are considering the area of executive functioning as an important feature of diagnosis.

Various symptoms overlap in the diagnosis of schizophrenia and bipolar disorder. Current research is trying to find out the level of intensity of executive functioning between these two groups. Both disorders were selected because; the cognitive impairment is an explicit feature among these illnesses. It would be helpful to professionals; for assessment, diagnosis, and to make an effective treatment plan for better outcomes.

Executive functions are necessary for goal-directed behavior. People, who have problems of executive functioning, are not able to perform everyday jobs spontaneously. The American Heritage Dictionary of the English Language (2013) describes the term executive function with the reference of cognitive process as it regulates an individual's ability to organize thoughts and activities, prioritize tasks, manage time efficiently, and make decisions. Logsdon (2014) studied the executive functioning Disorder among children with learning disabilities and describes that multiple brain functions are the determinants of executive function. It is important for the cognitive process/to solve a problem, to think about the solutions and to implement. He also specified that psychologists have different views about executive functions as well about their functioning areas. According to Barkley (2001) the signs and symptoms regarding executive functioning among children and adolescents are that they have problems with organizing and scheduling tasks. He also suggested that; parents and teachers necessarily acquire knowledge about the executive functioning to assess and diagnose.

Research suggests that Executive Functioning was a good exponent for the assessment of schizophrenia; the functional outcome in the schizophrenic group, whereas clinical variables were an indicator of bipolar disorder (Martinez et al., 2002). To understand the difference between both disorders, the prerequisite is to reveal the concept of mental illness. Mental illnesses are the conditions that affect a person's mood, behavior or thoughts in a way that is distressing or impairs functioning (Purse, 2013).These illnesses are the consequence of complex genetic, psychological, and environmental factors. Psychosis is a generic descriptive term applied to behavior marked by a break from reality, and this often presents as; disorganization of mental processes, emotional aberrations difficulty in interpersonal relationships, and a decrease in functional capacity (Philip, Manco, Rosalined, & Lennie, 1998).

Literature review suggested that; genetic tendency is a more prominent factor in the development of mental illnesses (Edward, 2011). It could be physical or psychological or a combination of both. (Pankey & Hayes, 2003). The nature of severe mental illness has been under debate since long. It has been suspected for over a century that schizophrenia and manic-depressive disorder (bipolar disorder) are disorders of the brain (Maier, Zobel, & Wagner, 2006). Executive dysfunction in patients of psychotic disorders may be more related to their symptom profile than their diagnosis (Karvariti, Dixon, Frith, Murray, & Mcguire, 2005).

The symptoms or a criterion for Bipolar disorder is a condition that causes psychological and physical problems, to have negative effect on everyday life. The most important features of bipolar disorder are that a patient experiences extremes of mood, ranging from mania or hypomania (Marcia, 2011). According to APA (2000) criteria of DSM-IV^{TR}; the essential feature of Bipolar I Disorder is a clinical course that is characterized by the occurrence of one or more Manic Episodes or Mixed Episodes, Often individuals have also one or more Major Depressive Episodes.

However, some people experience their first symptoms during childhood, while others develop them later in life. Bipolar disorder is often not recognized as an illness, and people may suffer for years before it is properly diagnosed and treated (Schoenstadt, 2010). Bipolar disorder is classified according to the pattern and severity of the symptoms as bipolar disorder I, bipolar disorder II, or cyclothymic disorder. Patients with one type may develop another. Bipolar disorder is the most common psychotic disorder, and experts believe that it occurs in 1% of people among all age groups (New York Times, 2011).

As far as schizophrenia is concerned, it is a mental disorder characterized by impairments in the perception or expression of reality and by significant social or occupational dysfunction (APA, 2000). Schizophrenia literally means "split mind". It is characterized by gross distortions of reality and disturbances in the content and form of thought, perception, and affect.

Symptoms of schizophrenia are divided into positive and negative types. Positive symptoms are behaviors, thoughts, or affects added to normal behavior. Examples include delusions, hallucinations and disorganized speech or catatonic behavior. Negative symptoms involve the absence of normal or desired behavior. An example is that of flat affect (APA, DSM-IV^{TR}, 2000).

It has been observed for many years that some individuals with schizophrenia and bipolar disorder cannot think clearly. Studies identified two major reasons: first; cognitive impairment, and second; lack of awareness of illness. Schizophrenia includes impairment of many cognitive functions, such as thought formation, memory, language, attention, many of the positive symptoms of schizophrenia, including hallucinations and delusions, can be extremely distressing (Emery & Oltmanns, 2000).

Goldberg (1999) concludes that patients with schizophrenia perform consistently worse than patients with bipolar disorder on a variety of higher-level cognitive tasks and bipolar patients demonstrate impairment in comparison to healthy controls. In a study comparison between patients with schizophrenia, bipolar disorder, and a control group, there were significant differences in immediate verbal memory, visual spatial constructional abilities, attention, language, and delayed memory, research also indicate that schizophrenia and bipolar disorder are associated with significant cognitive impairments (Dickerson et al., 2004).

Some other variables are also important to discuss as an associated features that effects on executive functioning area; use of medication or drug, brain injuries and developmental process. Morgan and Scott (2000) suggested that drugs and alcohol users show impairments on tests of executive function. Some of these deficits may result from heavy substance use, and there is also evidence that problems with executive functions may contribute to the development of substance use disorders.

The brain plays an essential role in executive function. People with frontal lobe injuries have difficulty in the performance of higher level processing of executive functions. Due to its concreteness, the frontal cortex develops more slowly than other parts of the brain, and many executive functions do not fully develop until adolescence. Some executive functions also appear in old age, and some executive function deficits are to be noticed at the onset of mild dementia (Encyclopedia of Mental Disorder, 2013).

The above mentioned researches reveal clearly that schizophrenic and bipolar individuals show impairments in executive functioning, which create difficulties in executive functioning. It is an important factor to consider for the assessment and diagnosis of both disorders. After reviewing the literature the following hypothesis was formulated; Executive Functioning will be more impaired in patients with schizophrenia as compared to patients with bipolar disorder.

Method

Participants

The sample comprised of 120 individuals, selected from psychiatric hospitals of Karachi city, 60 individuals with schizophrenia (30 males, 30 females) and 60 individuals with bipolar disorder (30 male, 30 females). The age ranged from 18 to 35 years. In order to collect the data, the purposive sampling method was used.

Measures

Demographic Information Form

A demographic information form was administered to select the requisite sample. It consists of; registration number, name, age, gender, level of education, diagnoses, duration of illness, year from the onset of the problem, number of hospitalization, mental status, medication, socioeconomic status, residential area etc.

Cognitive Symptoms Checklist (CSC; O'Hara, Harrell, Bellingrath, & Lisicia, 1993)

CSC based on five sub-checklists (attention or concentration, memory, language, executive functioning, and speed processing). Current research considers executive functioning as a separate variable. CSC is helpful for the identification and treatment of cognitive functioning. This checklist is valid for clinical settings in four major areas; screening, assessment, treatment, and planning. For the administration; age range of CSC is 16 and older. The scoring was followed according to standard procedure as; High scores are indicative of impaired executive functioning, whereas low scores show low or no impairment.

Procedure

Formal permission for data collection was taken, from the authorities of different Psychiatric hospitals of Karachi. With the consent of hospital's authority, researcher approached patients, who were registered in hospital. In the initial phase of the study; demographic information form was filled by the examiner with the help of the hospital registration file, and then individually collect the information from patient. The record of the patients was used to confirm and select the required criteria as; the age range, gender,

duration of illness and diagnoses. Further information was collected from participant (Patient); Level of education (minimum grade 10), Level of understanding English language. Exclusion Criteria for Participant's was as follows;

- Patients with severe mental conditions were excluded.
- Excluded those, who were unable to communicate or have no reality contact.
- Excluded participants with co-current mental disabilities like; brain injury, neurological condition, substance use or mental retardation.

First 30 to 40 minutes session was taken with each participant individually to put them at ease and to build a rapport and to confirm selection criteria and the level of stability.

Ethical Considerations

Researcher conveys the purpose of research to the participants in very general terms. Patient's involvement in the research was voluntary and they were free either to participate or not. Furthermore, participants were assured about the confidentiality of the personal information.

Operational Definitions of Key Terms

Executive Functioning: The term executive function describes a set of cognitive abilities that control and regulate abilities and behaviors. They include; the ability to initiate and stop actions, to monitor and change behavior as needed, and to plan future behavior when faced with novel tasks and situations. Executive functions allow us to anticipate outcomes and adapt to changing situations. (Encyclopedia of Mental Disorders, 2013).

Schizophrenia: Schizophrenia is the most chronic and disabling of the severe mental disorders, disturbances in several areas of thought, perception, and attention, motor behaviour, affect or emotion, disorganized speech and behaviour, delusions, and hallucinations and life functioning. It is also associated with abnormalities of brain structure and function. It is sometimes called a psychotic disorder or a psychosis (APA, DSM-IV^{TR} 2000).

Bipolar Disorder: Bipolar disorder is the name given to a group of mental disorders characterized by extreme fluctuations in mood. People diagnosed with bipolar disorders experience moods ranging from deepest depression to mania, often with periods of less extreme moods, or even emotional stability, in between, can be result in damaged relationships, poor job or school performance, and even suicide (APA, DSM-IV^{TR} 2000).

Results

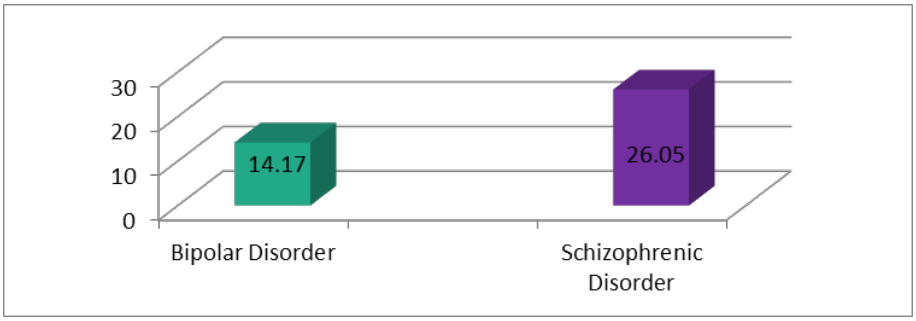
Table 1

Difference between Schizophrenia and Bipolar Disorder Patients on the Variable of Executive Functioning

**p<.01

Groups	n	M	SD	df	t	P	95% CI LL	95% CI UL
Bipolar Disorder	60	14.17	13.54	118	4.05	.00**	17.68	6.08
Schizophrenic Disorder	60	26.05	18.19					

Figure 1 Mean Difference between Schizophrenia and Bipolar Disorder Patients on the Variable of Executive Functioning



Discussion

The term Executive Functioning is relatively new. In the recent era executive functioning is also to be considered as a functional important area for diagnosis. Current research focuses on Executive Functioning for the diagnosis of schizophrenia and bipolar disorder. Executive functioning is a sub-category of cognitive function. It could be described as the ability to appropriate performance in everyday life activities as; the ability to initiate or stop actions, to maintain daily routine, sequencing or organizing task, or to monitor and change behavior as needed.

Result indicate that there is a significant difference between the patients of schizophrenia and bipolar disorder on the variable of executive functioning, it signifies that the executive functioning is more impaired among schizophrenic (M = 26.05) patients as compared to patients with bipolar disorder (M = 14.17).

As discussed that, executive functioning is responsible for pattern of thinking and adjustment with reality in good manners. It implies that this functioning area is important to consider while diagnosis and treatment. Chandler (2013) also identifies that executive functioning include decision making about conflicting information or demands. A study describes three major components of executive functioning; Working memory; to retain information for a specific time (to remember a phone number), mental flexibility; to shift attention on different tasks appropriately and self-control; to resist impulsive action. These components are interlinked with each other, and the successful application of these activities is responsible for appropriate executive function (National Scientific Council on the Developing Child, 2011). This information helps to assess the impairment in executive functioning. If the symptoms are present between schizophrenia and bipolar disorder, these components are expected to be found more impaired among schizophrenic patients. During the assessment and diagnosis process this knowledge can help psychologists and psychiatrists to differentiate them.

The understanding of executive functioning is essential toward making a diagnosis as well as to make a treatment plan. It will be supportive to attain better outcomes. Few negative symptoms of schizophrenia are also indicators of impaired executive functioning as; the absence of normal or desired behavior. In which person's emotional expressions are blunted such as flat affect, apathetic behaviour. Studies also supports the results that schizophrenia and bipolar; both groups have shown impairment in executive functioning but schizophrenic patients showed more impairment comparatively with bipolar disorder (Martinez et al., 2002).

Pradhan, Chakrabarti, Nehra, & Mankotia (2008) suggested that patients with schizophrenia consistently perform worse than patients with bipolar disorder. Some studies are showing impairment in functional areas but no difference on some inferior task. A research indicates that there are no significant differences between patients of schizophrenic and bipolar disorder in terms of maintaining the sorting set (Stewart, 1997).

When person suffer from bipolar disorder there must be manic or hypo manic episode. In manic episode the person, daily functioning is used to be impaired and they are unable to participate in daily routines in useful manners. Another study describes that, those with bipolar disorder showed cognitive dysfunction in verbal memory and frontal executive tasks in relation to the control group (Martinez et al., 2004).

Some other associative features are also to be considered that causes impaired executive functions, as; brain injuries, developmental process, poor psychosocial functioning, low neuropsychological performance and use of substance or medication. Executive functioning was also described with reference to the developmental process. It could be observed during a child's school performance, interferences with the ability to start and complete school work on time (Web MD, 2013). As Barkley (2001) suggested that children and adults with executive function disorder (EFD) have problems with organizing and scheduling. It was also found that many executive functions do not fully develop until adolescence. Some executive functions deficits appear on decline in older people, and some, may associate with signs of mild dementia (Encyclopaedia of Medical Disorders, 2013).

Brain functioning is also a considerable factor to understand executive functioning. Recent researches emphasize on brain functioning as a part of the cognitive process. Researches indicate that executive functioning is a set of mental skills and the coordination

area in the brain is the frontal lobe (Lichter, David, Jeffrey, & Cummings, 2001). Martinez et al. (2004) also describes that low neuropsychological performance was associated with poor functional outcome. Executive functioning deficits can run in families. Executive functioning is also associated with other important factors as; mental retardation, brain injury, continuation of psychiatric medication, or neurological conditions.

Conclusion

Executive functions are an important component of one's ability to perform successful adaptation and performance in real-life situations. It is concluded that there is a significant difference in executive functioning between the patients of schizophrenia and bipolar disorder. Patients with schizophrenia exhibit more impairment as compared to patients with bipolar disorder; this difference indicates the areas of impairment are prominently effects on thought process of an individual; Patients' were unable to do sequential tasks or expression of reality, to shift attention on different tasks appropriately and to manage their routine activities. Some other important areas are strongly associated with executive functioning such as; neural functioning, brain injuries, developmental process of brain, substance use and psychiatric medications.

Limitations

- Sample was limited to Karachi city.
- Data collection was also narrowed down due to selection criteria.
- The data was restricted because sample was based only on clinical population.

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