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Role of Positive-Negative Symptoms of Schizophrenia on Motivation and Cognitive Problems

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ABSTRACT

Investigating positive-negative symptoms, motivation, and cognitive functioning in individuals with schizophrenia was the aim of the current study. In this cross-sectional study, 70 outpatients with schizophrenia who were 19 years of age or older participated. Every participant finished the Montreal Cognitive Assessment Scale (MoCA), the Situational Motivation Scale (SIMS), and the Brief Psychiatric Rating Scale (BPRS-4.0). The hypothesis that positive symptoms would boost motivation and have no effect on cognitive functioning in schizophrenia patients while negative symptoms would lower motivation and cognitive functioning was examined using linear regression. The results reflected that positive symptoms significantly increase the motivation and had no effect on cognitive functioning in schizophrenic patients. The results also have revealed that negative symptoms significantly decrease the motivation patients whereas it was a non-significantly predictor of cognitive functioning in schizophrenic patients. These findings might help in development and providing interventions to schizophrenic dealing with problems with motivation and cognitive functioning.

Introduction

The World Health Organization (2020) classified schizophrenia as a serious mental issue that can be described by significant disturbances in how a person thinks, perceive speak and sense of oneself. Further, it also accompanies substantial disability that may impair performance of an individual in education and working. This impairment could be due to of the loss of an obtained ability to gain a vocation, or the interruption of studies. In early days, schizophrenia was known to be identical with split or multiple personality but this is not correct, which originate variety of misunderstandings about the reason of illness. However, the exact cause of schizophrenia is still

vague but it is believed that amalgamation of heredity, environmental and neurotransmitters might contribute in the development of the disorder (Parekh, 2017). The word schizophrenia was brought into the clinical setting towards the start of this era by Eugen Bleuler, a Swiss psychiatrist. He stated schizophrenia as a significant mental disorder, causes of which are still obscure to a great extent and which includes a set of impairments (Barbato, 1998). Typically, it starts in initial adulthood or late adolescent period that affects person's thought, behavior and emotions which may develop with age and never end. People with schizophrenia are two to three times more probable to death than healthy population. It might be due to the inevitable physiological illnesses in schizophrenics, such as infections, cardiovascular and metabolic ailment (Patel, 2016; Laursen, Nordentoft, & Mortensen, 2014).

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), schizophrenia is a disruption that consists of hallucination, delusion, confused and unorganized speech and behavior or negative signs for not less than a month. These disturbances should last for more than six months. These problems might be the reason of dysfunction in people's emotion, behavior and cognition. In order to diagnose a person with schizophrenia, he or she show a group of features that are linked with impaired social and occupational functioning. The features of schizophrenia might differ significantly from person to person. Additionally, these symptoms usually emerge between mid-teenage and mid- thirties. However, the highest age of the beginning of the disease is mid and end of twenties in men and women respectively (American Psychiatric Association, 2013).

Schizophrenia can cause significant impairment and disability in numerous areas of life. This happens due to the availability and severity of schizophrenic symptoms. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) has distributed schizophrenia symptoms in two major domains. One is positive symptoms and the second is negative symptoms (American Psychiatric Association, 2013). Positive symptoms are characterized by the presence of weird and unusual additional feelings or behavior in an individual. These are also known as psychotic symptoms whereas, negative symptoms are depicted by reduction in goal-oriented activities, including talking, social activities and non-verbal gestures. These declines cause hindrance in everyday working and intrudes with the recovery system (Favrod, et al., 2019).

A study was conducted in Pakistan to explore the pattern of negative, positive and psychopathology sign of schizophrenia amongst different schizophrenic patients. The research was conducted in 2016 to 2017 with schizophrenia patients aged 18 to 52. The outcomes were different among outdoor and indoor patients, individuals with chronic and acute schizophrenia as well as people who have one or more than one episode of schizophrenia. The results showed the people who have chronic schizophrenia, outdoor patients and having multiple episode are more susceptible to get positive and negative symptoms than others (Abbas, et al., 2019).

Positive and negative symptoms can also be the source of different psychological issues in schizophrenic patients. Motivational problems are one of them. Motivation is a multidimensional concept, having different domains and each having distinct theoretical perspective (Trémeau et al., 2013). It is often used to elucidate people's behavior. Motivation can also be described as a procedure to initiate, directs and sustain goal-oriented behavior, such as treatment for the disease. Basically, it can be seen as a driving force that trigger individuals to do something in order to accomplish a task or an aim. Internal and external factors can be the reason for motivation. The involvement in some activity because people find it internally pleasing and satisfying are known as

intrinsic motivation, whereas if people's performance on an activity depends upon the outcome but not on the behavior itself, it is then known as extrinsic motivation (Legault, 2016).

Impaired motivation is one of the central deficit of schizophrenia which affect person's psychological and social outcome (Nakagami, et al., 2010) as well as their capability to involve and take advantage from treatment (Choi & Medalia, 2010). The motivation role for successful treatment were studied the most with various behavioral and psychosocial treatments. Usually, the benefit of different psychosocial treatments has been associated with the people's awareness for the requirement of the treatment as well as their capability to acquire new skills that are being taught during the process (Yamada, et al., 2010; Medalia & Brekke, 2010).

One study has been conducted by Foussias and colleagues (2009), investigated the relation between several symptoms including positive and negative symptoms of schizophrenia and motivational impairment in schizophrenic adults. The findings from twenty-one schizophrenia adults revealed that motivational deficit are associated with only negative symptoms. Further, it also suggests that motivational impairment is the main connection between negative symptoms and poor functioning in schizophrenia patients. Another study investigated the association between impairment in motivation and symptoms of schizophrenia including positive and negative symptoms. In the study, forty schizophrenic patients were compared with twenty-three healthy adults to measure motivational problems. The study suggested that more people with schizophrenic showed impairment in motivation in comparison to healthy individuals. The impairment seemed to be related with negative but not with positive symptoms of schizophrenia. Further, this impairment speared to be related with cognitive dysfunctioning among schizophrenic patients (Schmand, Kuipers, Gaag, Bosveld, Bulthuis, & Jellema, 1994).

Schizophrenia can also cause a lot of problem in an individual's cognition, which impair his or her daily life functioning. This is known to be a significant issue after motivation in schizophrenics. Cognitive dysfunction in schizophrenic patients has a noteworthy effect on their practical functioning status (Green, 2016). So, it is imperative to study the functioning of cognition in people having schizophrenia.

Cognition refers to the cognitive abilities that are usually involved in understanding and gaining information. These mental processes involve how people think, perceive, judge, remember, and solve problems (American Psychological Association, 2018). These process can be explained in detail. First, attention is a cognitive ability which helps a person to focus on particular stimuli among various others happening at the same time in the environment. Further, language is another cognitive process that allow us to comprehend and direct our thoughts by speaking or writing words. It plays an important role in our communication with others and thinking as well. Similarly, memory is a cognitive skill that allow us to encode, save and regain information from the past. It plays an important part in learning procedure and permit us to recall our previous information. Moreover, perception or awareness is another skill of cognition through which we get data through our senses from the environment and use this information for reacting and interacting with others. Lastly, thinking or thought process is a vital part in cognition. It involves us higher functioning of brain including reasoning, solving problems and making decisions (Salazar, 2019; Lacy & Stark, 2013).

A study was conducted in order to investigate the severity of cognitive impairment in different psychotic disorders and the findings suggest that the impairment in cognition was most sever in schizophrenics compared to others. Cognitive dysfunction is linked with poor functional outcome.

The more detailed analysis result described that schizophrenics showed impaired verbal memory and processing speed domain (Sheffield, et al., 2018).

The positive and negative symptoms can be associated with cognitive functioning in schizophrenic patients. Kaneko (2018) conducted a study on schizophrenia patients in Japan to find out the relationship between negative symptoms and cognition. The results indicated that negative symptoms of schizophrenia can have significant impairment in different domains of cognition including: memory, executive functioning and consideration.

A research was conducted to investigate the relationship of cognition, neuro cognition and social cognition with symptoms of schizophrenia. The findings showed severe negative symptoms are associated with poor IQ, social and neuro cognition. Further, negative symptoms had negative effect on social cognition. Higher level of delusions was linked with higher IQ. High positive symptoms were associated with impaired perception but contingent upon the presence of negative symptoms (Bliksted, et al., 2017)

Schizophrenia, along with its symptom dimensions can cause a lot of motivational and cognitive impairment. These deficits can drastically reduce the functional outcome among individuals. Clinical psychologists and psychiatrists are focusing on recovery of schizophrenic patients with the aim of improving their overall functioning and well-being as well as treating symptoms of the disease. Different medical professionals are focusing on developing new and advanced treatment including, therapies and medications that can help in ameliorating the severity of schizophrenia.

The researches and the reviewed literature has confirmed that there positive and negative symptoms of schizophrenia has some kind of relationship with motivation and cognitive functioning. The current study investigates positive-negative symptoms of schizophrenia. Motivation and cognitive functioning.

Research Methodology

Design

In the current investigation, a cross-sectional study was conducted. A cross-sectional survey collects data in order to make concurrent inferences about the population under investigation. According to Lavrakas (2008), a cross-sectional design represents the population from whom data is gathered.

Participants

The sample of the research was schizophrenic patients' age above 19 years.

Inclusion criteria

1. Diagnosed schizophrenic
2. Only adult respondents were taken
3. Out-patient were taken as sample

Exclusion criteria

1. The study excluded participants with physical illnesses, disabilities, or neurological or other psychiatric abnormalities.
2. Participants with a history of substance abuse and head injuries were not allowed to participate in the study.
3. The study did not include inpatient individuals with schizophrenia.
4. The study did not include children or adolescents.

Sampling technique

Utilizing the purposive sample technique, participants were gathered. Age, outpatient status, and a diagnosis of schizophrenia were the criteria used for selection. It's a non-probability sampling technique. Using the purposive sampling strategy, the researcher purposefully excluded participants based on the quality of the variables needed for the study. After the researcher identified the need, information was gathered from those who were willing to contribute the appropriate level of expertise and understanding (Bernard, 2002).

Measures

Participants' data was collected using the following instruments. Ventura et al. (1993a, 1993b) employed the Brief Psychiatric Rating Scale (BRPS 4.0) to assess the participants' positive and negative symptoms. The scale examines many features of schizophrenia and consists of 24 items on a 7-point Likert scale. It has a.89 reliability rating. For the current study, the scale was translated into Urdu. Only positive and negative subscales were employed for the current study. According to the symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatry Association, 2013), the items were allocated to these subscales. Schizophrenic patients' motivation for treatment was investigated using the Situational Motivation Scale (SIMS) (Guay et al., 2000). The measure is self-reporting. The test has 16 items on a 7-point Likert scale, and the subscales' respective Cronbach alphas were.95,.80,.86, and 77. For the current study, the scale was translated into Urdu. Additionally, schizophrenia patients were given the Urdu version of the Montreal Cognitive Assessment scale (MoCA: Habib et al., 2010) to evaluate their cognitive functioning. It's a fast way to check for minor cognitive impairment. Executive functioning, memory, computation, attention, language, direction, theoretical thinking, delayed recollection, visuospatial skills, naming, and decision-making are among the cognitive areas that are measured. MoCA takes about ten minutes to administer. The MoCA exam has a maximum possible score of 30, and a score of 26 or higher indicates normal cognitive functioning. It has demonstrated an exceptional 87% specificity for moderate cognitive impairment and Alzheimer's disease. The Montreal Cognitive Assessment exam had a Cronbach's alpha of.83 and a test-retest reliability of.92. Nasreddine and associates, 2005. With a Cronbach's alpha of 0.71, comparable to that of the MMSE, the MOCA has demonstrated strong dependability in patients with schizophrenia. Alvarez, Orizco, Ramírez, and Orellana (2014).

Procedure

Purposive sampling technique was used to recruit sample for the research. The sample contained participants who were diagnosed with schizophrenia disorder. Age of the participants was 19 or above. Moreover, the participants must be outpatients. The sample was collected from Umar Arshad Hospital, Gujrat, Pakistan. The scale batteries, written informed consent, and formal permission letter were given to the hospital authorities in order to collect data. The hospital

leaders were given an explanation of the current study. The participants were contacted at the hospital following written consent from the authorities. A detailed instruction and description about the benefits of the current research was given to the respondents. Furthermore, the assurance was given to the participants about the confidentiality of the data and their identity. Additionally, the respondents were asked to provide written consent. Only willing people were part of the research. Researcher built rapport with the participants by giving self-introduction, overview and main purpose of the study and their association with the institution. After that, demographic form, Brief Psychiatric Rating Scale, Montreal Cognitive Assessment Scale and The Situational Motivation Scale were administered on the schizophrenic patients. The respondents were interested to fill the scales and chose the suitable responses according to their state of mind. The consent to use all the scales in the present study was gained through e-mail from the respective authors. Later, the researcher conveyed appreciation and gratitude to the respondents for providing all the desired information in order to complete the research. The e-mail address and contact number was also provided to the respondents at the end of data collection as if anyone wants to know the outcome of the research. Finally, researcher strongly appreciated the effort and support of participants and hospital heads in the course of data collection.

Data Analysis

Descriptive statistics and regression analysis were used in the current research.

Results

This section provided the comprehensive explanation of statistical analysis that was used in the study. Statistical analysis was completed by Statistical Package for the Social Sciences (SPSS, V 21.0) for Windows. The majority of participants belong an age group of 30-40 and were females. The majority of respondents were illiterate, unemployed, unmarried and live in nuclear family system. Most of the participants have siblings' 3 to 5. Majority family income was less than 15000. Nearly half of the participants were living with schizophrenia for 6-10 year. 33 percent people were having number of hospitalization in the range of 0-3 times. Majority of the respondents did not feel better at any time during a year and did not feel better in any season. Most of the individuals feel low level of improvement in their health.

Table 1: Summary of Regression Analysis of Positive Symptoms as Predictor of Motivation in Schizophrenic Patients (N=70)

Predictor	**B**	**SE B**	**β**	**t**	**p**
Constant	29.756	10.169	—	2.926	.005
Total Positive	0.856	0.323	.306	2.648	.010

$R = .306$, $R^2 = .093$, Adjusted $R^2 = .080$, $F(1, 68) = 7.01$, $p = .010$.
B = unstandardized regression coefficient; SE B = standard error of B; β = standardized regression coefficient.

The hypothesis stated that positive symptoms would increase the motivation in schizophrenic patients. The summary of linear regression analysis showed that the result has supported the hypothesis. Result indicated positive symptoms predict motivation in schizophrenic patients. The results showed there was a significant predictive relationship ($F(1, 68) = 7.01$, $p = .010$) between positive symptoms and motivation. Furthermore, positive symptoms and motivation shows a

positive significant direction (β = .306, p < .010). The results indicated that 9.3% variation in motivation was due to positive symptoms in schizophrenic patients.

Table 2: Summary of Regression Analysis of Positive Symptoms as Predictor of Cognitive Functioning in Schizophrenic Patients (N=70)

Predictor	**B**	**SE B**	**β**	**t**	**p**
Constant	8.824	1.547	—	5.704	.000
Total Positive	0.004	0.049	.011	0.088	.930

$R = .011$, $R^2 = .000$, Adjusted $R^2 = -.015$, $F(1, 68) = 0.008$, $p = .930$.
B = unstandardized regression coefficient; SE B = standard error of B; β = standardized regression coefficient.

In another hypothesis positive symptoms was the predictor of cognitive functioning in schizophrenic patients. The results showed there was a non-significant predictive relationship ($F(1, 68) = 0.008$, $p = .930$) between positive symptoms and cognitive functioning. Further, positive symptoms and cognitive functioning shows a positive direction (β = .011, p < .930).

Table 3: Summary of Regression Analysis of Negative Symptoms as Predictor of Motivation in Schizophrenic Patients (N=70)

Predictor	**B**	**SE B**	**β**	**t**	**p**
Constant	108.327	11.870	—	9.126	.000
Total Negative	−1.623	0.367	−.472	−4.420	.000

$R = .472$, $R^2 = .223$, Adjusted $R^2 = .212$, $F(1, 68) = 19.54$, $p < .001$.
B = unstandardized regression coefficient; SE B = standard error of B; β = standardized regression coefficient.

In another hypothesis negative symptoms was the predictor of motivation in schizophrenic patients. The model explained 22.3% of the variance in motivation (R2 =.223) due to negative symptoms. The results showed a significant predictive relationship ($F(1, 68) = 19.54$, $p < .001$) between negative symptoms and motivation. Further, negative symptoms have significantly decreased the motivation in schizophrenic patients (β = −.472, p < .00).

Table 4: Summary of Regression Analysis of Negative Symptoms as Predictor of Cognitive Functioning in Schizophrenic Patients (N=70)

Predictor	**B**	**SE B**	**β**	**t**	**p**
Constant	10.650	1.940	—	5.491	.000
Total Negative	−0.053	0.060	−.106	−0.880	.382

$R = .106$, $R^2 = .011$, Adjusted $R^2 = -.003$, $F(1, 68) = 0.775$, $p = .382$.
B = unstandardized regression coefficient; SE B = standard error of B; β = standardized regression coefficient.

Whether negative symptoms predicts cognitive functioning was investigated using regression analysis. The model only explained 1.1% of the variance in cognitive functioning (R2 =.011), according to the results, which showed that it was not significant ($F(1, 68) = 0.775$, $p = .382$). This suggests that negative symptoms did not significantly affect cognitive functioning in this

population, since the predictor negative symptoms was not a significant predictor ($\beta = -.106$, $p = .382$).

Discussion

Schizophrenia (SCZ) is a severe mental disease having substantial impact on an individual's quality of life. Worldwide, it has occurrence of 0.16 to 1 in every 10,000 people per annum. According to World Health Organization (WHO), SCZ has the prevalence rate of 0.4% in public. It usually adults with the age of 20 to 30 year. Schizophrenia may cause impairment in social functioning of an individual. According to a report of WHO, it is considered to be the most common illness that has high proportion of years lived with disability (YLD). It is one of the prominent reason of illness burden and amongst the top ten expensive diseases in world (Cowen, et al., 2012).

Positive symptoms would boost schizophrenic patients' motivation, according to the first theory. The idea is supported by the investigation of the results, which revealed that positive symptoms boost motivation in schizophrenia patients. Our findings are supported by a smaller but comparable body of literature. Positive symptoms may boost motivation in people with schizophrenia, according to various studies (Raij et al., 2018; Fervaha et al., 2018; Junginger & McGuire, 2004).

A recent study's second hypothesis examined the idea that pleasant symptoms in schizophrenia patients would not impact their cognitive ability. The hypothesis has been validated by the outcome. The current conclusion that positive symptoms have no impact on cognitive functioning in individuals with schizophrenia has also been corroborated by earlier research (Zhang et al., 2018; Bliksted et al., 2017; Zhu et al., 2019).

The current study's third hypothesis examined how depressive symptoms can lower schizophrenic patients' motivation. The hypothesis has been validated by the overall outcome. Negative symptoms may lower motivation in people with schizophrenia, according to research (Morra et al., 2015; Waltz & Gold, 2015; Raij et al., 2018; Strauss et al., 2016).

Lastly, the study's premise examined the idea that negative symptoms would impair schizophrenic patients' cognitive abilities. The findings showed that there is no significant correlation between negative symptoms and cognitive ability in individuals with schizophrenia. Consequently, the theory is not supported by the existing findings. The present conclusion that negative symptoms do not interfere with cognitive functioning is supported by a small number of studies (Galaverna et al., 2014; Harvey et al., 2006; McGurk et al., 2000).

Conclusion

It was concluded that positive symptoms have a relationship with motivation whereas no predictive relationship with cognitive functioning. Same trend was evident in negative symptoms as it has a relation with motivation however no predictive association with cognitive functioning.

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