

Deficits in Schizophrenia: Moral Cognition, Emotion and Executive Dysfunctions

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Abstract. Schizophrenia, since first being distinguished as an individual mental disorder in 1887, has remained a controversial minority of psychopaths even until nowadays. Whilst benefiting from some particular protection against the law, there have always been prejudices and discriminations targetin patients diagnosed with schizophrenia. Schizophrenia patients also have a noticeable crime rate compared with normal people. Researchers have discovered and dug deep into some contributors to the cognitive deficits in schizophrenia patients, whereas few of them included all of those factors. Therefore, this literature review intends to give adequate information on cognitive deficits of schizophrenia through 5 different perspectives: (i) Impairment in moral cognition of schizophrenia patients, (ii) emotional deficits of schizophrenia patients, (iii) acoustic recognition of schizophrenia patients, (iv) executive dysfunctioning of schizophrenia patients. In conclusion, these factors are all highly related to the cognitive impairments in schizophrenia with the support of data in the research.

Keywords: Cognition; schizophrenia; psychopathology; moral cognition.

1. Introduction

Schizophrenia is a type of mental disorder that often show the symptom of hallucinations and delusions [1]. It is rather universal for schizophrenia to manifest with an impairment in cognition. There are approximately 0.32% of people affected by the symptoms of schizophrenia all around the world, whereas discrimination and prejudice are often experienced by this minority group within the population [1]. The violation of human rights of schizophrenia can lead to a rapid deterioration of their symptoms, and furthermore, resulting in a shorter average lifetime in this group of patients having psychosis [1]. Moreover, apart from the personal impact accompanying their lives, the cognitive deficits of schizophrenia can evoke further social issues such as social dysfunction and a rise in crime rates. Thus, it is crucial to raise awareness and provide sufficient information about schizophrenia to the general public, which is the main goal of this article. Apparently, researchers have already explored a diverse variety of leading factors to cognitive deficits in schizophrenia, such as impairments in social cognition, moral cognition, executive function, and so on. There are also researchers who dig deep into the reason behind that deficiency through multiple advanced technologies in computer science. For instance, a study by Su et al. looked into the neuro-integration of the dorsolateral prefrontal cortex in the brain utilising functional magnetic resonance imaging (fMRI), finding out a correlation of neuro-integration to the impairment in executive function [2]. However, there are few studies combining these leading factors together to demonstrate the cognitive deficits in schizophrenia, most of which mainly focused on parts of these contributing factors. Therefore, in this article, the author will give a review of the contributing factors of cognitive deficits in schizophrenia.

2. Method

Literature research of sufficient comprehension was conducted utilising the academic database of Google Scholar. The following search terms and their derivatives were entered: “moral cognition,” “schizophrenia,” executive dysfunction,” “acoustic recognition,” and “emotional deficits.” Studies are included if they (i) comprise empirical data, (ii) was published in and after 1990 (Since studies

before can be out of date due to undeveloped techniques), (iii) refer to impairments of cognition in schizophrenia.

3. Literature Review

3.1. Moral Cognition

Cognition refers to the ability to perceive, process, and store information, along with the skills in decision-making and problem-solving [3]. It is remarkable that there are 6.48% homicide offenders with schizophrenia in a developed country. This may be correlated to moral cognition [4].

Moral cognition refers to the ability of people to distinguish right from wrong, and it has a great contribution to the decision-making of a person. There may be various judgments behind the same actions taken by different groups of people, and poor moral cognition can result in an increased number of criminal behaviours. For example, in a study on moral cognition of schizophrenia patients, it is notable that the patients showed a deficient ability to appraise the rate of violence related to social conditions [4]. It took a longer average time for them to complete the questions about the prohibition in society, along with a diminished level of empathy. In addition, a study by Baez et al. indicates that patients with schizophrenia displayed a more severe impairment in social cognition. This vague conceptualisation that schizophrenia patients have can be correlated to a higher potential crime rate.

In a study by O'Reilly et al., researchers found that there is a positive correlation between the specific symptoms of delusions and particular emotional deficits. For instance, the delusion of jealousy may stimulate the moral cognition of betrayal, resulting in crimes of passion and honour killings [5, 6]. There are various types of abnormal moral cognitions triggered by different delusions, which will further issue in other aggressive behaviours.

3.2. Emotional Deficits of Schizophrenia

A review article by Trémeau suggests that schizophrenia shows emotional deficits from three aspects:

3.2.1. Verbal Expression

Compared to people without schizophrenia, people with this mental disorder often fail to describe the emotion accurately while being able to know the concept of this specific emotion. Along with the poor vocabulary of people with schizophrenia mentioned in another article, they might also be impaired in receiving and retrieval of information.

Moreover, in a review article by King et al. through various tests investigating the emotional expression of people diagnosed with schizophrenia, it can be concluded that people with schizophrenia reacted to be less expressive orally under a range of social circumstances such as being in a conversation with others, being interviewed one-sidedly, and in the scenario of role-playing [7-9].

3.2.2. Facial Expression

Several studies investigated the reactions of facial muscles in people with schizophrenia and normal people. Most of the results claimed that people with schizophrenia are less expressive in both voluntary and involuntary emotions. For example, in an experiment applying computer analysis of facial expressions of schizophrenia by Schnerder et al., the results suggested that patients with schizophrenia had reduced facial expression while interacting with people. Meanwhile, results of a study by Iwase et al. looking into the emotional expressions and emotional experiences of schizophrenia patients also inferred that people with schizophrenia had a descent facial expression of their past emotional experiences [10].

3.3. Acoustic Recognition

In a study by Rinat et al., it is elaborated that people with schizophrenia showed a lower accuracy than the control group of normal people in reporting the emotions presented in a speech, where there is a range of characteristics of voices manifested according to the altering emotion of the speech. Moreover, in this study, people with schizophrenia also exhibited a deficit in auditory emotion recognition tests, as they also presented a diminished ability to distinguish the tone in the speech, which is highly correlated with their performance in the report of emotion in the speech [11, 12]. Overall, schizophrenia showed a lack of sense and ability to present various kinds of emotion. With the absence of judgemental emotions as criteria, schizophrenia may not be conscious of their reprehensible acts, which can have a negative impact on their moral cognition.

3.4. Executive Dysfunctions

3.4.1. Executive Dysfunctions at A Premorbid Stage

Executive functioning involves attention, working memory, the flexibility of thinking, and self-control [7]. Schizophrenia is also frequently considered to have an impairment in executive functions.

A study investigating the dynamic and static cognitive deficits in children suggested that children who will later on develop be diagnosed with schizophrenia manifested with a lower IQ than the comparison and people who will later on develop depression. Moreover, these children showed impairments in verbal comprehension, perceptual organisation, and freedom of distractibility through cognitive tests with normal people and those who will, later on, develop depression. Additionally, in this study of premorbid deficits of schizophrenia, researchers found out that patients diagnosed with schizophrenia also presented an aggravation and lagging of development [13].

3.4.2. Executive Dysfunctioning at A Developed Stage

In most studies, people with schizophrenia have a distinctive disorder in their executive functions. In 2 studies that investigated the verbal fluency of people diagnosed with schizophrenia, both showed that they had a distinctively weaker ability to carry out oral tasks with various types compared with the control group [14, 15].

Furthermore, in 2 studies experimenting on the working memory of schizophrenia patients through multiple ways of testing, researchers of both studies found that people diagnosed with this mental disorder showed an attenuate function in working memory as they performed less decently than the control group [13, 14, 16].

4. Implications

The aim of this article was to provide an overview of cognitive deficits in patients diagnosed with schizophrenia with an extended inclusion of more aspects in the realm of cognitive psychology. In addition, the article may offer help in the clinical rehabilitation of schizophrenia afterward by listing a number of factors contributing to the mental disorder while delivering adequate information to the general public in order to prevent further discrimination and prejudice due to lack of information. In order to improve the review, more studies need to be done extensively by outstretching the perspectives to a broader point of view so that more factors relating to cognitive deficits of schizophrenia can be discovered.

5. Conclusion

The article gives an extensive review of the cognitive impairments of schizophrenia patients. In the beginning, a clear definition of cognition was given, as cognition is defined as the ability to perceive, process, and store information. After that, each imperative contributor to the deficiency on cognition in schizophrenia, which is impairment on moral cognition, emotional deficit, acoustic deficits, and executive dysfunctions, are named clearly, supported by a sufficient number of data

obtained from research. In order to conclude, these factors are highly correlated with the cognitive deficits in schizophrenia with the evidence from researches.

References

- [1] Schizophrenia. Retrieved on 10th Nov. 2023. Retrieved from: <https://www.who.int/news-room/fact-sheets/detail/schizophrenia>
- [2] Su, T. W., Lan, T. H., Hsu, T. W., Biswal, B. B., Tsai, P. J., Lin, W. C., & Lin, C. P. (2013). Reduced neuro-integration from the dorsolateral prefrontal cortex to the whole brain and executive dysfunction in schizophrenia patients and their relatives. *Schizophrenia research*, 2013, 148(1-3): 50-58.
- [3] Cognition in Psychology: How People Think and What's Involved in This Process. Retrieved on 10th Nov. 2023. Retrieved from: <https://www.verywellmind.com/what-is-cognition-2794982>
- [4] Large, M., Smith, G., & Nielssen, O. The relationship between the rate of homicide by those with schizophrenia and the overall homicide rate: a systematic review and meta-analysis. *Schizophrenia research*, 2009, 112(1-3): 123–129.
- [5] McGuire, J., Brüne, M., & Langdon, R. Judgment of moral and social transgression in schizophrenia. *Comprehensive psychiatry*, 2017, 76: 160-168.
- [6] O'Reilly K, Donohoe G, O'Sullivan D, Coyle C, Corvin A, O'Flynn P, O'Donnell M, Galligan T, O'Connell P, Kennedy HG. A randomized controlled trial of cognitive remediation for a national cohort of forensic patients with schizophrenia or schizoaffective disorder. *BMC Psychiatry*. 2019, 19(1): 27.
- [7] What is executive function? Retrieved on 10th Nov. 2023. Retrieved from: <https://www.understood.org/en/articles/what-is-executive-function>
- [8] Bowie C R, Harvey P D. Cognitive deficits and functional outcome in schizophrenia [J]. *Neuropsychiatric disease and treatment*, 2006, 2(4): 531-536.
- [9] Trémeau F. A review of emotion deficits in schizophrenia. *Dialogues in clinical neuroscience*, 2022, 8(1): 59-70.
- [10] Iwase, M., Yamashita, K., Takahashi, K., Kajimoto, O., Shimizu, A., Nishikawa, T., Shinosaki, K., Sugita, Y., & Takeda, M. (1999). Diminished facial expression despite the existence of pleasant emotional experience in schizophrenia. *Methods and findings in experimental and clinical pharmacology*, 1999, 21(3): 189–194.
- [11] Schneider, F., Heimann, H., Himer, W., Huss, D., Mattes, R., & Adam, B. S. Computer-based analysis of facial action in schizophrenic and depressed patients. *European Archives of Psychiatry and Clinical Neuroscience*, 1990, 240: 67-76.
- [12] Berenbaum H. Posed facial expressions of emotion in schizophrenia and depression. *Psychological medicine*, 1992, 22(4): 929–937.
- [13] Jenkins, L. M., Bodapati, A. S., Sharma, R. P., & Rosen, C. Working memory predicts presence of auditory verbal hallucinations in schizophrenia and bipolar disorder with psychosis. *Journal of Clinical and Experimental Neuropsychology*, 2018, 40(1): 84-94.
- [14] Gavilán, J. M., & García-Albea, J. E. Executive dysfunction in schizophrenia and its association with mentalizing abilities. *Revista de Psiquiatría y Salud Mental (English Edition)*, 2015, 8(3): 119-129.
- [15] Haugen, I., Stubberud, J., Ueland, T., Haug, E., & Øie, M. G. Executive dysfunction in schizophrenia: predictors of the discrepancy between subjective and objective measures. *Schizophrenia Research: Cognition*, 2021, 26: 100201.
- [16] Baez, S., Herrera, E., Villarin, L., Theil, D., Gonzalez-Gadea, M. L., Gomez, P., Mosquera, M., Huepe, D., Strejilevich, S., Vigliecca, N. S., Matthäus, F., Decety, J., Manes, F., & Ibañez, A. M. Contextual social cognition impairments in schizophrenia and bipolar disorder. *PloS one*, 2013, 8(3): e57664.