



Anosognosia

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Anosognosia, also called lack of insight, is a symptom of SMI that prevents people from knowing that they are experiencing symptoms such as delusions or hallucinations and is the most common reason for not seeking or maintaining treatment among people with SMI. Early psychosis interventions, antipsychotic medications, some psychotherapeutic interventions, and tDCS may be effective at improving insight for some people with severe mental illness.

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reason for not seeking or maintaining treatment among people with SMI is anosognosia

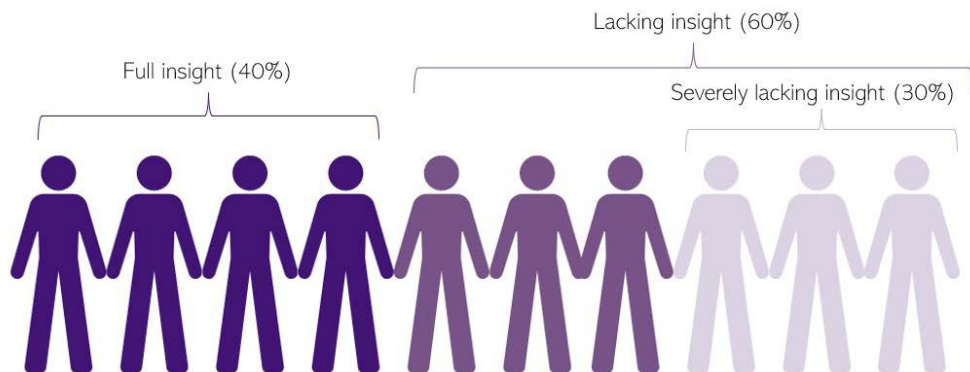
typically due to anosognosia, a debilitating symptom of severe mental illness.

What is anosognosia?

When someone with severe mental illness insists that there is nothing wrong and as a result, refuses to accept treatment, it can be frustrating to caregivers and treatment providers who just want to see their loved one or patient avoid further deterioration and get well. However, research shows that an individual's refusal to accept treatment is

Anosognosia, also called lack of insight, is a biological condition that prevents many people with severe mental illness from knowing that they have a mental illness. It is different from denial and defensiveness. People who are in denial about having a mental illness recognize that something about their mental state has changed but would not call this change an 'illness' and do not think treatment would help. Someone with anosognosia, on the other

Anosognosia in Schizophrenia



Amador, X., et al. (1994). Awareness of illness in schizophrenia and schizoaffective and mood disorders. Arch Gen Psychiatry, 51

[When patients] were asked whether they had any mental, psychiatric, or emotional problems, about one half answered 'no'. Usually, the negative response was emphatic and at times was followed by unusual explanations of why they were inpatients on a psychiatric ward. These ranged from "because my parents brought me here" to stranger beliefs, such as "I'm just here for a general physical." Whereas the majority of people with depression and anxiety disorders actively seek treatment because they feel bad and want help, these people, by contrast, were unaware of having a serious mental illness – Dr. Xavier Amador, PhD

hand, typically has no idea that there has been any change or decline in their mental state, behavior or functioning. Anosognosia is thought to be the most common reason for treatment refusal and treatment drop-outs for people with severe mental illness.¹

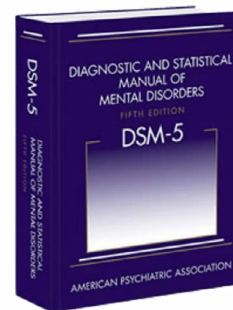
Anosognosia is estimated to be present to some extent in approximately 60% of people with schizophrenia and other psychotic disorders and 50% of people with bipolar disorder.^{2,3,4} Approximately 30% of people with schizophrenia and 20% of people with bipolar disorder have severe anosognosia with no awareness of their illness or symptoms.

While some people with anosognosia lack insight into having a mental illness at all, others may lack awareness only of specific symptoms. For example, while approximately 30% of people with schizophrenia had no awareness of having a disorder at all, 60% of people with schizophrenia had no awareness of their delusions, and 40% had no awareness of having hallucinations, according to one study.⁵ For some people, especially those with bipolar disorder, the level of insight someone has into their condition is likely to fluctuate over time.^{6,7}

Causes of anosognosia in severe mental illness

Anosognosia was first discovered by physicians who noticed that after a traumatic brain injury or a stroke, some patients would become unable to

Unawareness of illness is typically a symptom of schizophrenia itself rather than a coping strategy. It is comparable to the lack of awareness of neurological deficits following brain damage, termed anosognosia.



[It] includes unawareness of symptoms and may be present through the entire course of schizophrenia. Anosognosia is also common in Schizoaffective Disorder.

– DSM V, p.116 & 123

recognize changes in their abilities, such as being unable to move one side of their body. Anosognosia can also occur in people with Alzheimer's disease.⁸ Former president Ronald Reagan, for example, had full awareness of having Alzheimer's disease at the onset of his illness and even publicly announced his diagnosis. However, as his symptoms became more severe, he lost awareness of having a disease and even became unable to recognize his family members.⁹ As with Alzheimer's disease and traumatic brain injury, anosognosia in severe mental illness is thought to be caused by changes or differences in brain structure due to brain damage.

Our understanding of the relationship between anosognosia and various parts of the brain is still evolving. However, based on current research, there are several brain structures that may be related to anosognosia, including:

The frontal lobe

The frontal lobe is an important part of the brain for cognitive skills like memory, problem solving, and metacognition.^{10,11,12} Accordingly, damage to the frontal lobe may make it difficult for people with psychosis to make sense of their past symptoms and experiences, accurately compare their current abilities with what they could do in the past, and understand the beliefs of family members, friends, and care providers.¹³ Low insight into having an illness has been associated with smaller prefrontal grey matter volume in schizophrenia patients,¹⁴ higher frontal lobe dysfunction,¹⁵ and poor memory of autobiographical life events.¹⁶ In addition to smaller gray matter volume, people with schizophrenia and low insight also have less brain activity in areas of the prefrontal cortex.

Figure 1 (shown below) shows functional MRI (fMRI) brain images of people with schizophrenia taken while they were asked to complete tasks that required them to engage in self-reflection or think about themselves. Areas that are colored red are areas of high activity in the brain during this self-reflection. People with

schizophrenia and high self-reflectiveness had significantly better activation in the medial prefrontal cortex than people with schizophrenia who had low self-reflectiveness.¹⁷

The right hemisphere

Many studies have found a relationship between damage or decreased volume in the right hemisphere of the brain and anosognosia.^{18,19,20} This relationship between right hemisphere damage and anosognosia has been found in both stroke survivors and people with severe mental illness. Specific areas of the right hemisphere impacted include the inferior temporal lobe, the dorsal lateral prefrontal cortex, and the inferior parietal lobe.

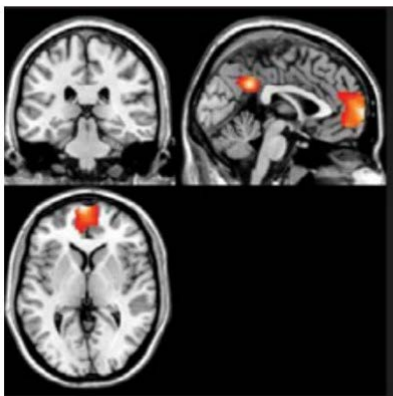
Brain volume & gray matter

Gray matter, also called unmyelinated neurons, are cells that process information in the brain. People with schizophrenia and anosognosia have less gray matter than people with schizophrenia who do not have anosognosia.²¹ Smaller amounts of gray matter have been found in many areas of the brains of people with severe mental illness and anosognosia, such as the medial superior frontal gyrus, inferior frontal gyrus, inferior temporal gyrus, cerebellum,²² left posterior cingulate cortex, right precuneus, cuneus,²³ left superior, left middle and right inferior temporal gyri, right inferior parietal lobule, right supramarginal gyrus,²⁴ right anterior cingulate, left posterior cingulate, and inferior temporal region on both sides of the brain.²⁵

In addition to lower gray matter volume, people with anosognosia have been found to have smaller overall brain volume, smaller white matter volume, and smaller cortical thickness in many areas of the brain²⁶ than people without anosognosia.

Figure 1

Brain activation of someone with schizophrenia and high self-reflectiveness



Brain activation of someone with schizophrenia and low self-reflectiveness



Self-reflectiveness measured by the Beck Cognitive Insight Scale

Pictures courtesy of Annerieke E. de Vos, Department of Neuroscience, University Medical Center, Groningen, the Netherlands

EXPERIENCING ANOSOGNOSIA AND DELUSION

To illustrate the how delusions are experienced by people who have anosognosia, Dr. Xavier Amador provides the following example based on his clinical experience:

“Imagine I told you that you did not live where you live. You might laugh and tell me to stop joking around. But what if I produced a restraining order from a court that ordered you to stay away from what you told me was your home address? Taking it further, let’s say you live with other people, perhaps members of your family, and you saw that they had signed off on this court order. What would you think? Then, imagine that you then called them to ask why they’d signed off, and they said something like, ‘You seem like a nice person, but if you keep coming around here, we are going to call the police. You don’t live here, and we don’t want to press charges, but we will if you put us in that position. Please stop calling us. You need help!’ If you can imagine something like this happening to you, then you have idea of what it is like for someone with a mental illness to have a delusion and anosognosia”

(Excerpt from the book: “I’m Not Sick, I Don’t Need Help”, Vida Press, NY, 2020, p.59)

Other research has also shown associations between anosognosia and brain connectivity,²⁷ hemispheric asymmetry,²⁸ and impairments in midline brain structures,²⁹ among others. Because of the biological and anatomical underpinnings of anosognosia, it is important to recognize that people who experience anosognosia cannot overcome it from willpower, nor can they be convinced that their delusions or hallucinations are not real. However, it is also important to note that in some people, anosognosia can improve with treatment.

Treatment options for anosognosia **Interventions for early psychosis**

Anosognosia may be prevented or diminished by early, effective treatment.³⁰ Early psychosis programs are a type of intervention for people experiencing their first episode of psychosis. In these programs, a team of social workers, peer specialists, and other care providers work together to provide treatment. These programs have been shown to improve short- and long-term outcomes for people with psychosis.³¹ There is also some evidence to support the effectiveness of early psychosis programs on improving insight. People with schizophrenia who were enrolled in an early intervention

program improved their insight more than those in an alternative treatment program. The largest increases in insight took place in the first six months of joining the program.³²

Antipsychotic medications

Antipsychotic medications can be a useful tool for many people with severe mental illness to manage their symptoms and improve their quality of life. There is some evidence to suggest that antipsychotic medications can also improve insight^{33,34,35} with the biggest improvements in insight occurring during the first three months of treatment.³⁶ However, despite the significant impact of insight in treatment adherence, few studies of antipsychotic medications have examined changes in insight.

Psychological interventions

Given the prevalence of medication non-adherence in people who have anosognosia, researchers have explored several strategies within psychotherapy that can help people with severe mental illness to improve insight. There are several psychological interventions for people with severe mental illness that have been shown to improve insight to some extent, according to research.³⁷ These include:

- Cognitive behavioral therapy for psychosis
- Motivational interviewing
- Metacognitive reflection and insight therapy
- Mindfulness-based treatments

Importantly, some psychological interventions, such as motivational interviewing, can also help people with anosognosia to improve their medication and treatment adherence, even when insight does not increase.

tDCS

Transcranial Direct Current Stimulation (tDCS) is a type of non-invasive brain stimulation that is safe, painless, and inexpensive, and it has been shown to improve symptoms for a variety of mental illnesses, particularly major depressive disorder.³⁸ tDCS has also been shown to improve insight for people with schizophrenia.^{39,40} In a systematic review that examined the impact of tDCS on insight in thirteen randomized controlled trials, patients with schizophrenia who received at least ten sessions of tDCS had improved insight into their illness, compared to those who did not receive tDCS.⁴¹

While there are many treatments that have been shown to improve anosognosia in some people with severe mental illness, it is important to note that insight does not improve with treatment for all patients. Further research in this field is needed to identify treatments that may help to improve anosognosia for patients whose insight does not improve with treatment.

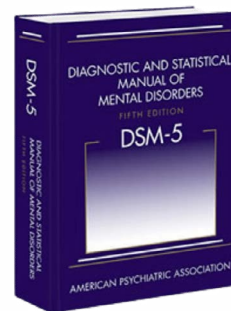
Anosognosia and adverse outcomes

Anosognosia can negatively impact the lives of people with severe mental illness in a variety of ways. People who lack insight into having a mental illness are often those

with more severe symptoms and may be at risk for many negative outcomes. There is also evidence to suggest that those with impaired insight may:

- be more likely to relapse and be readmitted to a hospital⁴²
- have poor quality of life⁴³
- have more severe symptoms⁴⁴
- have lower community functioning, including social contact, social support, social skills, and prosocial behavior⁴⁵
- be more likely to commit violent acts⁴⁶
- be less likely to adhere to treatment^{47,48}
- be less likely to be employed for pay or volunteer⁴⁹

One of the most important of these may be treatment nonadherence.



[Anosognosia] is the most common predictor of non-adherence to treatment, and it predicts higher relapse rates, increased number of involuntary treatments, poorer psychosocial functioning, aggression, and a poorer course of illness. – DSM V, p.101

Anosognosia is the most common reason for treatment non-adherence in people with schizophrenia, according to the DSM V.⁵⁰ The relationship between anosognosia and nonadherence to treatment is very understandable. One researcher described this relationship saying, “Logically, persons who are sure of their own good health would not take medications to treat a disease that they do not have.”⁵¹ In another research presentation about anosognosia, the presenter described the relationship between anosognosia and treatment non-adherence by asking the audience to raise their hands if they would take insulin when they were certain that they did not have diabetes. Unsurprisingly, no hands went up.⁵²

While the relationship between anosognosia and non-adherence to treatment is understandable, it has significant consequences. People with schizophrenia who do not adhere to treatment may have lower self-reported quality of life⁵³ and be more likely to relapse.⁵⁴ Medication noncompliance is also one of the best predictors of violence for people with severe mental illness.⁵⁵

“Logically, persons who are sure of their own good health would not take medications to treat a disease that they do not have” – Dr. Kozlowski Gibson, PhD

Other considerations with anosognosia

Psychological wellbeing

Good awareness of having a mental illness is associated with better treatment compliance and a variety of other positive outcomes. However, it is also important for people with severe mental illness, their loved ones, and their care providers to know the unique challenges that come with having insight into one’s own severe mental illness.

High levels of insight into mental illness have been associated with higher levels of depression,^{56,57} self-stigma,⁵⁸ emotional distress,⁵⁹ and suicidality,⁶⁰ as well as lower hope⁶¹ and self-reported quality of life.⁶² The association between insight and psychological distress may exist because people with anosognosia are protected from the stigma attached to a severe mental illness diagnosis, because they do not believe they have an illness. They may also be protected from the distress of experiencing psychotic symptoms without full knowledge of their abnormality.^{63,64}

Cultural considerations

When determining whether a person with severe mental illness has anosognosia, it may be important to consider their cultural and religious background. The idea that severe mental illness is a biological disease

is not present in all cultures. It would not be appropriate to determine that a person has anosognosia because of differences in beliefs about the causes or necessary treatments for their symptoms.

One review of studies proposed that a person should be determined to have insight if they know there has been a change in their body or mind that has impacted their ability to function and acknowledge the need to restore their previous abilities. Using this definition, a person could be determined to have insight even if they do not believe their symptoms represent an illness. The author notes that a person with delusional explanations for their symptoms (i.e., those that differ from family and local cultural explanations) would not be considered to have insight using this definition.⁶⁵

Conclusion

Anosognosia is a symptom of severe mental illness. Someone with anosognosia is unable to recognize that they are experiencing symptoms of a mental illness. This can have tragic consequences, such as refusal to accept treatment, which can increase the likelihood of lower quality of life and a host of other negative outcomes. Anosognosia appears to be caused by differences in brain structure and cognition. It is different from defensiveness, denial, self-stigma, and delusion. Early psychosis interventions, antipsychotic medications, some psychotherapeutic interventions, and tDCS may be effective at improving insight for some people with severe mental illness. In some cases, these interventions can also help people with anosognosia because they do not need to accept their diagnosis to participate and benefit. People with anosognosia and their loved ones may want to note the importance of normalizing and addressing the difficult emotions that may emerge as insight improves.

REFERENCES

- ¹ American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC.
- ² Fennig, S., et al. (1996). Insight in first admission psychotic people. *Schizophrenia Research*, 22
- ³ Amador, X., et al. (1994). Awareness of illness in schizophrenia and schizoaffective and mood disorders. *Arch Gen Psychiatry*, 51
- ⁴ American Psychiatric Association. (2000). Diagnostic and Statistical Manual of Mental Disorders: DSM IV. American Psychiatric Association Press. p.304
- ⁵ Amador, X., et al. (1994). Awareness of illness in schizophrenia and schizoaffective and mood disorders. *Arch Gen Psychiatry*, 51
- ⁶ Ghaemi, S. N., & Rosenquist, K. J. (2004). Is insight in mania state-dependent?: a meta-analysis. *The Journal of nervous and mental disease*, 192(11), 771-775.
- ⁷ Lee, K.H., Brown, W.H., Egleston, P.N., Green, R.D., Farrow, T.F., Hunter, M.D., Parks, R.W., Wilkinson, I.D., Spence, S.A., Woodruff, P.W. (2006). A functional magnetic resonance imaging study of social cognition in schizophrenia during an acute episode and after recovery. *American Journal of Psychiatry*, 163, 1926–1933.
- ⁸ Starkstein S. E. (2014). Anosognosia in Alzheimer’s disease: diagnosis, frequency, mechanism and clinical correlates. *Cortex; a journal devoted to the study of the nervous system and behavior*, 61, 64–73. <https://doi.org/10.1016/j.cortex.2014.07.019>
- ⁹ Torrey, E. F. (1985). *Surviving schizophrenia: A family manual*. Harper & Row Publishers, p. 48
- ¹⁰ Burton, L. (2021). Metacognition and Frontal Lobe Functioning. *Clinical Neuropsychiatry*, 18(2), 86
- ¹¹ Kozlowski-Gibson, M. (2018). Witnessing life with schizophrenia and anosognosia: a qualitative research study. *J Psychiatry Behav Health Forecast*. 2018; 1 (2), 1007.
- ¹² Fuster, J. M. (2002). Frontal lobe and cognitive development. *Journal of neurocytology*, 31(3), 373-385.
- ¹³ Sapara, A., et al. (2016). Voxel-based magnetic resonance imaging investigation of poor and preserved clinical insight in people with schizophrenia. *World Journal of Psychiatry*, 6(3), 311.
- ¹⁴ Sapara, A., et al. (2007). Prefrontal cortex and insight in schizophrenia: a volumetric MRI study. *Schizophrenia Research*, 89, 22–34
- ¹⁵ Young, D. A., Davila, R., & Scher, H. (1993). Unawareness of illness and neuropsychological performance in chronic schizophrenia. *Schizophrenia Research*, 10
- ¹⁶ The relationship between insight and autobiographical memory for emotional events in schizophrenia.
- ¹⁷ van der Meer, L., de Vos, A.E., Stiekema, A.P., Pijnenborg, G.H., van Tol, M.J., Nolen, W.A., David, A.S., Aleman, A. (2013). Insight in schizophrenia: Involvement of self-reflection networks? *Schizophrenia Bulletin*, 39(6), 1288–1295.
- ¹⁸ Gerretsen, P., et al. (2013). Frontotemporoparietal asymmetry and lack of illness awareness in schizophrenia. *Human brain mapping*, 34(5), 1035-1043.
- ¹⁹ Jehkonen, M., Laihosalo, M., & Kettunen, J. (2006). Anosognosia after stroke: assessment, occurrence, subtypes and impact on functional outcome reviewed. *Acta Neurologica Scandinavica*, 114(5), 293-306.
- ²⁰ Orfei, M. D., et al. (2008). Unawareness of illness in neuropsychiatric disorders: phenomenological certainty versus etiopathogenic vagueness. *The Neuroscientist*, 14
- ²¹ Sapara, A., et al. (2016). Voxel-based magnetic resonance imaging investigation of poor and preserved clinical insight in people with schizophrenia. *World Journal of Psychiatry*, 6(3), 311.
- ²² Berge, D., Carmona, S., Rovira, M., Bulbena, A., Salgado, P., Vilarroya, O. (2011). Gray matter volume deficits and correlation with insight and negative symptoms in first-psychotic-episode subjects. *Acta Psychiatrica Scandinavica*, 123, 431–439.

- ²³ Morgan, K.D., Dazzan, P., Morgan, C., Lappin, J., Hutchinson, G., Suckling, J., Fearon, P., Jones, P.B., Leff, J., Murray, R.M., David, A.S. (2010). Insight, grey matter and cognitive function in first-onset psychosis. *British Journal of Psychiatry*, 197(2), 141–148.
- ²⁴ Cooke, M.A., Fannon, D., Kuipers, E., Peters, E., Williams, S.C., Kumari, V. (2008). Neurological basis of poor insight in psychosis: a voxel-based MRI study. *Schizophrenia Research*, 103, 40–51.
- ²⁵ Ha, T.H., Youn, T., Ha, K.S., Rho, K.S., Lee, J.M., Kim, I.Y., Kim, S.I., Kwon, J.S. (2004). Gray matter abnormalities in paranoid schizophrenia and their clinical correlations. *Psychiatry Research*, 132, 251–260.
- ²⁶ Buchy, L., Ad-Dab'bagh, Y., Malla, A., Lepage, C., Bodnar, M., Joober, R., Sergerie, K., Evans, A., Lepage, M. (2011). Cortical thickness is associated with poor insight in first-episode psychosis. *Journal of Psychiatry Research*, 45(6), 781–787.
- ²⁷ Gerretsen, P., Menon, M., Mamo, D.C., Fervaha, G., Remington, G., Pollock, B.G., Graff-Guerrero, A. (2014). Impaired insight into illness and cognitive insight in schizophrenia spectrum disorders: Resting state functional connectivity. *Schizophrenia Research*, 160, 43–60.
- ²⁸ Gerretsen, P., Chakravarty, M.M., Mamo, D., Menon, M., Pollock, B.G., Rajji, T.K., Graff-Guerrero, A. (2013). Frontotemporoparietal asymmetry and lack of illness awareness in schizophrenia. *Human Brain Mapping*, 34, 1035–1043
- ²⁹ Morgan, K.D., Dazzan, P., Morgan, C., Lappin, J., Hutchinson, G., Suckling, J., Fearon, P., Jones, P.B., Leff, J., Murray, R.M., David, A.S. (2010). Insight, grey matter and cognitive function in first-onset psychosis. *British Journal of Psychiatry*, 197(2), 141–148.
- ³⁰ Malla, A.K., et al (2011). Duration of untreated psychosis is associated with orbital-frontal grey matter volume reductions in first episode psychosis. *Schizophr Res.* 2011;125(1):13–20. doi: 10.1016/j.schres.2010.09.021
- ³¹ McDonagh, M. S., et al. (2022). Psychosocial interventions for adults with schizophrenia: an overview and update of systematic reviews. *Psychiatric Services*, 73.
- ³² DeTore, N. R., et al. (2022). A randomized controlled trial of the effects of early intervention services on insight in first episode psychosis. *Schizophrenia Bulletin*.
- ³³ Bianchini, O., et al. (2014). Effects of antipsychotic drugs on insight in schizophrenia. *Psychiatry research*, 218(1-2), 20-24.
- ³⁴ Mattila, T., et al. (2017). The impact of second generation antipsychotics on insight in schizophrenia: Results from 14 randomized, placebo controlled trials. *European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology*, 27
- ³⁵ Pallanti S., Quercioli L., Pazzagli A. (1999). Effects of clozapine on awareness of illness and cognition in schizophrenia. *Psychiatry Res* 86(3):239-249
- ³⁶ Pijnenborg, G. H. M., et al. (2015). Differential effects of antipsychotic drugs on insight in first episode schizophrenia: Data from the European First-Episode Schizophrenia Trial (EUFEST). *European Neuropsychopharmacology*, 25(6), 808-816.
- ³⁷ Lysaker, P. et al. (2018). Insight in schizophrenia spectrum disorders: relationship with behavior, mood and perceived quality of life, underlying causes and emerging treatments. *World Psychiatry*, 17(1), 12-23.
- ³⁸ John Hopkins Medicine. (2022). *Brain Stimulation Services*. Retrieved from https://www.hopkinsmedicine.org/psychiatry/specialty_areas/brain_stimulation/services.html
- ³⁹ Blay, M., et al. (2021). Improvement of Insight with Non-Invasive Brain Stimulation in Patients with Schizophrenia: A Systematic Review. *Journal of Clinical Medicine*, 11(1), 40.
- ⁴⁰ Adam, O., et al. (2022). Efficacy of transcranial direct current stimulation to improve insight in patients with schizophrenia: A systematic review and meta-analysis of randomized controlled trials. *Schizophrenia Bulletin*
- ⁴¹ Adam, O., et al. (2022). Efficacy of transcranial direct current stimulation to improve insight in patients with schizophrenia: A systematic review and meta-analysis of randomized controlled trials. *Schizophrenia Bulletin*.
- ⁴² Drake, R. J., et al. (2015). Modeling determinants of medication attitudes and poor adherence in early nonaffective psychosis: implications for intervention. *Schizophrenia bulletin*, 41(3), 584-596.

- ⁴³ Kozlowski-Gibson, M. (2018). Witnessing life with schizophrenia and anosognosia: a qualitative research study. *J Psychiatry Behav Health Forecast*. 2018; 1 (2), 1007.
- ⁴⁴ Siu, C. O., et al. (2015). Insight and subjective measures of quality of life in chronic schizophrenia. *Schizophrenia Research: Cognition*, 2(3), 127-132.
- ⁴⁵ Lysaker, P. H., et al. (2018). Insight in schizophrenia spectrum disorders: relationship with behavior, mood and perceived quality of life, underlying causes and emerging treatments. *World Psychiatry*, 17(1), 12-23.
- ⁴⁶ Alia-Klein, N., et al. (2007). Insight into illness and adherence to psychotropic medications are separately associated with violence severity in a forensic sample. *Aggressive Behavior*, 33
- ⁴⁷ American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC.
- ²⁸ Velligan, D. I., et al. (2017). Why do psychiatric patients stop antipsychotic medication? A systematic review of reasons for nonadherence to medication in patients with serious mental illness. *Patient preference and adherence*, 11, 449.
- ⁴⁹ Olfson, M., et al. (2006). Awareness of illness and nonadherence to antipsychotic medications among persons with schizophrenia. *Psychiatric Services*, 57(2), 205-211.
- ⁵⁰ American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC.
- ⁵¹ Kozlowski-Gibson, M. (2018). Witnessing life with schizophrenia and anosognosia: a qualitative research study. *J Psychiatry Behav Health Forecast*. 2018; 1 (2), 1007.
- ⁵² Amador, X. (2005). "I Am Not Sick, I Don't Need Help!". Schizophrenia Society of Nova Scotia's 17th Annual Conference, 2005. Retrieved from <https://www.youtube.com/watch?v=Lstn6WNNcRC> and <https://www.youtube.com/watch?v=VxiBgg5G-cl>
- ⁵³ Vrbova, K., et al. (2017). Quality of life, self-stigma, and hope in schizophrenia spectrum disorders: a cross-sectional study. *Neuropsychiatric disease and treatment*, 13, 567.
- ⁵⁴ Coldham, E. L., Addington, J., & Addington, D. (2002). Medication adherence of people with a first episode of psychosis. *Acta Psychiatrica Scandinavica*, 106(4), 286-290.
- ⁵⁵ Torrey, E. F. (1985). *Surviving schizophrenia: A family manual*. Harper & Row Publishers, p. 273-277.
- ⁵⁶ Smith, T. E., Hull, J. W., & Santos, L. (1998). The relationship between symptoms and insight in schizophrenia: a longitudinal perspective. *Schizophrenia Research*, 33(1-2), 63-67.
- ⁵⁷ Schrank, B., et al. (2014). Insight, positive and negative symptoms, hope, depression and self-stigma: a comprehensive model of mutual influences in schizophrenia spectrum disorders. *Epidemiology and psychiatric sciences*, 23(3), 271-279.
- ⁵⁸ Schrank, B., et al. (2014). Insight, positive and negative symptoms, hope, depression and self-stigma: a comprehensive model of mutual influences in schizophrenia spectrum disorders. *Epidemiology and psychiatric sciences*, 23(3), 271-279.
- ⁵⁹ Ng, R., Fish, S., & Granholm, E. (2015). Insight and theory of mind in schizophrenia. *Psychiatry research*, 225(1-2), 169-174.
- ⁶⁰ Amador, X., et al. (1996). Suicidal behavior in schizophrenia and its relationship to awareness of illness. *Am J Psychiat*, 153, 1185-1188.
- ⁶¹ Schrank, B., et al. (2014). Insight, positive and negative symptoms, hope, depression and self-stigma: a comprehensive model of mutual influences in schizophrenia spectrum disorders. *Epidemiology and psychiatric sciences*, 23(3), 271-279.
- ⁶² Margariti, M., et al. (2015). Quality of life in schizophrenia spectrum disorders: associations with insight and psychopathology. *Psychiatry research*, 225(3), 695-701.
- ⁶³ American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC.
- ⁶⁴ Osatuke, K., et al. (2008). Insight in schizophrenia: a review of etiological models and supporting research. *Comprehensive Psychiatry*, 49(1), 70-77.
- ⁶⁵ Jacob, K. S. (2010). The assessment of insight across cultures. *Indian Journal of Psychiatry*, 52(4), 373.