

Research Article

Factors Associated with Cognitive and Social Functions of Psychiatric Inpatient with Schizophrenia

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Abstract: Schizophrenia is a chronic and severe mental disorder. The patients with schizophrenia usually experience the changes in their cognitive and social functions. This study aims to identify factors that associate with cognitive and social functions among inpatients with schizophrenia. Using the total sampling method, a total of 172 inpatients participated in this study. The cognitive and social functions were examined using the Mini Addenbrooke's Cognitive Examination (Mini-Ace) and personality social performance (PSP), respectively. Cognitive function significantly associated with education, cannabis use, and the duration of cannabis use ($p < 0.05$). Meanwhile, social function was significantly associated with gender, education, and family history ($p < 0.05$). Specific interventions are needed to improve the cognitive and social functions among inpatient with schizophrenia includes more therapies.

Keywords: Schizophrenia, Cognitive Function, Social Function.

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INTRODUCTION

Schizophrenia is a severe form of mental disorder that includes complex neurological disorders in neurotransmitters, neurocirculatory dysregulation, neuroanatomical impairment and electronic abnormalities (Gilmore, 2010). The prevalence of schizophrenia in Southeast Asia ranks as the second highest in Asian continent (Charlson *et al.*, 2018). The patients with schizophrenia usually experience the deterioration of their cognitive and social functions (Kurtz *et al.*, 2018). Following the discharge from psychiatric hospital, these two functions might affect the reintegration process of the patients in the community (Brissos *et al.*, 2011; Keefe & Harvey, 2012). Disturbances in cognitive function can also deteriorate their dependency, ability to work, quality of life, the severity of the disease, as well as increases self-care costs and risk of relapses (Keefe & Harvey, 2012). Improvement of cognitive function disorders is believed to be followed by improvement in social function (Kurtz *et al.*, 2018).

Some of previous studies have examined on factors that affect changes in cognitive function and social function in schizophrenic patients. It was found

that age (Atake *et al.*, 2018) and treatment (Green & Harvey, 2014) has a negative impact on cognitive. On the other hand, gymnastics or aerobics has a positive impact on cognitive function (Baker *et al.*, 2010). Also, gender and marital status do not affect cognitive function (Talreja *et al.*, 2013). There are no specific studies on the effect of ethnicity on the cognitive function of schizophrenic patients, but the study of (Veling *et al.*, 2010) stated that ethnic groups or minorities who experience social discrimination are vulnerable to schizophrenia. Furthermore, changes in social function can be influenced by socio-economic factors (Duțescu *et al.*, 2018). Limited research has discussed the effect of treatment and exercise on social functioning. Therefore, this study aims to determine the factors that associate with cognitive and social functions among patients with schizophrenia.

METHODS

The study was conducted from September to October, 2019. Using a total sampling method, all hospitalized patients during the study period in non-acute nursing wards of a psychiatric hospital were included in the study. A total of 172 patients with schizophrenia were tested for their cognitive and social

functions. The sampling inclusion criteria of the study includes the patients who willing to participate in, being diagnosed with schizophrenia based on DSM-TR IV, hospitalized for a minimum of four weeks, aged between 18 and 65 years, first attack or recurring attack.

Cognitive function was measured using Mini Addenbrooke's Cognitive Examination (mini-ACE) (Hsieh *et al.*, 2015) was translated into Indonesian with a Cronbach Alpha reliability test value of 0.94. The mini ACE was originally developed as a brief, bedside screening tool that tests the memory, visuospatial, and executive function of dementia. It has a maximum score of 30, where higher score indicates better cognitive function. A cut off $\leq 21/30$ used in the present study. Social function was measured using Personal and Social Performance (PSP) (Patrick *et al.*, 2009) has been tested for reliability with a Cronbach Alpha value of 0.72. PSP evaluation is divided into three categories i.e scores 71-100 indicates that there is no impairment or mild social functioning, scores 70-51 indicates moderate social functions and scores < 50 indicates poor social function. The independent variables in the present study includes all demographic and clinical features of the patients. The dependent variables were the cognitive and social functions and the personality social performance. The

research ethics committee of the Faculty of Nursing at Syiah Kuala University approved the study.

RESULTS

From the total of 185 of patients invited, 172 participated in this study (response rate 93%). The majority of respondents were male (82%), and ethnic Acehnese (85%). More than half of respondents were not married (66.9%). In terms of education, respondents have a high school/bachelor degree (41.3%), secondary education (34.3), basic education (24.4%). Respondents with poor cognitive function (72.7%) were more prevalent than respondents with good cognitive function (27.3%), while respondents with mild social function (72.7%) were more prevalent than respondents with moderate social functions (27, 3%). Detail of demographic and clinical characteristics of respondents are presented in Table 1.

The relationship between the independent variables and the M-Ace domain was tested using the Mann Whitney and Kruskal Wallis test, while the relationship between the independent variables with cognitive functions and social functions using the Chi-Square test. The results of data processing are presented in the table 2.

Table 1: Characteristics of Respondents (n = 172)

Characteristics of Respondents	Frequency	Percentage
Age		
<input type="checkbox"/> 20-30 year	48	27.9
<input type="checkbox"/> 31-50 year	96	55.9
<input type="checkbox"/> 51-64 year	28	16.3
Gender		
<input type="checkbox"/> Female	31	18
<input type="checkbox"/> Male	141	82
Marital Status		
<input type="checkbox"/> Not married	103	59.9
<input type="checkbox"/> Married	50	29.1
<input type="checkbox"/> Divorced	19	11
Education		
<input type="checkbox"/> Primary school	42	24.4
<input type="checkbox"/> Junior high school	59	34.3
<input type="checkbox"/> Senior High School – University	71	41.3
Ethnic		
<input type="checkbox"/> Aceh	146	84.9
<input type="checkbox"/> Non Aceh	26	15.1
Hospitalization		
<input type="checkbox"/> 1-2 times	61	35.5
<input type="checkbox"/> 3 times	64	37.2
<input type="checkbox"/> > 3 times	47	27.3
Cannabis Use		
<input type="checkbox"/> No	98	57
<input type="checkbox"/> Yes	74	43
Duration of cannabis consumption		
<input type="checkbox"/> No	98	57
<input type="checkbox"/> <1 year	52	30.2
<input type="checkbox"/> >1 year	22	12.8

The results of data analysis showed that education (p-value 0,001), history of cannabis use (p-value 0,0001), and duration of cannabis use (p-value 0,001) were factors that associated with cognitive

functions. Whereas social function was associated with gender (p-value 0,002) education (p-value 0,013) and family history of mental disorder (0,015)

Table 2: The association between demographic variables and cognitive, social performance.

Independent Variables	Cognitive function	Social function
Age	0,486	0,831
Gender	0,058	0,002*
Status Married	0,096	0,547
Ethnic	0,598	0,315
Education	0,001*	0,013*
Cannabis use	0,0001*	0,099
Duration of cannabis use	0,001*	0,032
Family history	0,059	0,015*

DISCUSSION

Education is the dominant factor associated with cognitive function (p-value 0.001) and has a strong relationship with all M-Ace domains. The relationship between the level of education with cognitive function is positive, so the increasing education of respondents, the higher the score of cognitive function in schizophrenic patients. The results of this study are in line with research by (Kaneda *et al.*, 2013), where they found the level of education associated with cognitive function, and also research by Rajji *et al* (2013) that low levels of education are more at risk of schizophrenia. Besides education, cannabis use was associated with cognitive function. This means that increasing cannabis use will decrease cognitive function. These results are consistent with the results by Radhakrishnan *et al* (2014) which suggests that cannabis use can cause temporary cognitive impairment especially in attention, memory (L. *et al.*, 2014) and verbal (Foti *et al.*, 2010).

The findings of this study as shown in Table 2, age, sex, marital status, ethnicity, frequency of hospitalization have no relationship with the cognitive function of schizophrenic patients (P-value > 0.05). As it can be observed in table 2, the age of patients has no significant relationship with cognitive function. This finding was confirmed by (Rajji *et al.*, 2014) which suggested that there was no relationship between age and cognitive function. In terms of sex, it is known that males are better at fluency domains p-value 0.001 and visuospatial p-value 0.0001. In contrast to (Talreja *et al.*, 2013) who put forward.

Marital status is known to have no relationship with cognitive function, but there is a relationship in the attention domain and M-Ace memory. These results are consistent with the study by (Talreja *et al.*, 2013), where they found that marital status affects the memory domain. This study does not examine the length of the

marriage, so the results obtained are different from the research of (Håkansson *et al.*, 2009) which states that people who live together/get married for more than 20 years will have less chance of cognitive decline compared to single people, separated or widow.

Likewise, family history is related to fluency and visuospatial domains. As much 11.6% of respondents stated that they have family members with schizophrenia. (Hughes *et al.*, 2005) in their research on three groups of respondents, namely the schizophrenia group, siblings and the control group. It was found that the schizophrenia group and the sibling group had a decrease in verbal fluency and were caused more by intellectual questions (IQ) rather than inherited.

Education also associated with social function. This means that the more patient education increases, the greater the rate of improvement in social functioning. Education is a very important factor to be able to interact and social relations with the environment. The results of interviews with several patients found that very cooperative patients have high school/equivalent education and have good mental status. This finding supports the opinion of (Bae *et al.*, 2010), that education is significantly related to social function. In this case, the social function will decrease in respondents with low socioeconomic levels. Likewise, the study by (Duțescu *et al.*, 2018) found that schizophrenic patients with the low education level significantly associated with the ability to perform social functions. Furthermore, Gender was significantly associated with social function (P-value = 0.001). This finding is supported by (Merhej *et al.*, 2017) where women have better social functions, when compared to men and women are proven more effective in the treatment of social function returns. Women have less mild depressive symptoms compared to men; the female hormone estrogen accelerate dopamine activity in the accumbent nucleus by inhibiting dopamine release. Besides, estrogen can protect against the onset

of symptoms of depression or anxiety through increased levels of serotonin in the brain (Weickert & Weickert, 2016)

In contrast to the results of research by (Li *et al.*, 2015) which explains that marital status is the most dominant variable influencing social functions, the present study found no significant relationship between marital status and social function. Furthermore, (Li *et al.*, 2015) explained that marital status helps patients make good decisions about their health compared to patients who are divorced or unmarried. Other studies Nyer *et al* (2010) found schizophrenic patients who were married or had lived together very likely to have better social functions, compared with patients who lived alone or divorced.

Family history was found to be significantly associated with social function of patients with schizophrenia (P-value = 0.009). The effect has a magnitude of -1,362, meaning that an increase in the number of patients with a family history of schizophrenia on social functioning perceived by respondents will have the opportunity to decrease social function by 0.256 times. So that the more schizophrenia patients who come from schizophrenic families, the worse the social function.

CONCLUSION

Overall schizophrenia patients experience changes in cognitive function and social function, but cannabis use and education factors are very dominant and significantly affect the cognitive function of patients. In other words, the lower the education schizophrenia patients have, the easier cognitive decline will occur. Likewise, with cannabis consumption, the more patients who consume cannabis will have the opportunity to experience cognitive decline. While the focus of the social function is the majority of schizophrenic patients are male. This means that male patients must be a priority in the provision of social interventions. Further studies should consider other various variables that might associate or determine the cognitive and social function as well as the patients with schizophrenia,

REFERENCES

1. Atake, K., Nakamura, T., Ueda, N., Hori, H., Katsuki, A., & Yoshimura, R. (2018). The impact of aging, psychotic symptoms, medication, and brain-derived neurotrophic factor on cognitive impairment in Japanese chronic schizophrenia patients. *Frontiers in Psychiatry*, 9 (MAY), 1–8. <https://doi.org/10.3389/fpsy.2018.00232>.
2. Bae, S. M., Lee, S. H., Park, Y. M., Hyun, M. H., & Yoon, H. (2010). Predictive factors of social functioning in patients with schizophrenia: Exploration for the best combination of variables using data mining. *Psychiatry Investigation*. <https://doi.org/10.4306/pi.2010.7.2.93>
3. Bae, S. M., Lee, S. H., Park, Y. M., Hyun, M. H., & Yoon, H. (2010). Predictive factors of social functioning in patients with schizophrenia: Exploration for the best combination of variables using data mining. *Psychiatry Investigation*. <https://doi.org/10.4306/pi.2010.7.2.93>
4. Baker, L. D., Frank, L. L., Foster-Schubert, K., Green, P. S., Wilkinson, C. W., McTiernan, A., ... Craft, S. (2010). Effects of aerobic exercise on mild cognitive impairment: A controlled trial. *Archives of Neurology*. <https://doi.org/10.1001/archneurol.2009.307>
5. Baker, L. D., Frank, L. L., Foster-Schubert, K., Green, P. S., Wilkinson, C. W., McTiernan, A., ... Craft, S. (2010). Effects of aerobic exercise on mild cognitive impairment: A controlled trial. *Archives of Neurology*. <https://doi.org/10.1001/archneurol.2009.307>.
6. Brissos, S., Molodynski, A., Dias, V. V., & Figueira, M. L. (2011). The importance of measuring psychosocial functioning in schizophrenia. *Annals of General Psychiatry*. <https://doi.org/10.1186/1744-859X-10-18>
7. Brissos, S., Molodynski, A., Dias, V. V., & Figueira, M. L. (2011). The importance of measuring psychosocial functioning in schizophrenia. *Annals of General Psychiatry*. <https://doi.org/10.1186/1744-859X-10-18>.
8. Charlson, F. J., Ferrari, A. J., Santomauro, D. F., Diminic, S., Stockings, E., Scott, J. G., ... Whiteford, H. A. (2018). Global epidemiology and burden of schizophrenia: Findings from the global burden of disease study 2016. *Schizophrenia Bulletin*. <https://doi.org/10.1093/schbul/sby058>
9. Charlson, F. J., Ferrari, A. J., Santomauro, D. F., Diminic, S., Stockings, E., Scott, J. G., ... Whiteford, H. A. (2018). Global epidemiology and burden of schizophrenia: Findings from the global burden of disease study 2016. *Schizophrenia Bulletin*. <https://doi.org/10.1093/schbul/sby058>.
10. Duțescu, M. M., Popescu, R. E., Balcu, L., Duica, L. C., Strunoiu, L. M., Alexandru, D. O., & Pîrlog, M. C. (2018). Social Functioning in Schizophrenia Clinical Correlations. *Current Health Sciences Journal*, 44(2), 151–156. <https://doi.org/10.12865/CHSJ.44.02.10>
11. Duțescu, M. M., Popescu, R. E., Balcu, L., Duica, L. C., Strunoiu, L. M., Alexandru, D. O., & Pîrlog, M. C. (2018). Social Functioning in Schizophrenia Clinical Correlations. *Current Health Sciences Journal*, 44(2), 151–156. <https://doi.org/10.12865/CHSJ.44.02.10>
12. Foti, D. J., Kotov, R., Guey, L. T., & Bromet, E. J. (2010). Cannabis use and the course of schizophrenia: 10-year follow-up after first hospitalization. *American Journal of Psychiatry*. <https://doi.org/10.1176/appi.ajp.2010.09020189>

13. Foti, D. J., Kotov, R., Guey, L. T., & Bromet, E. J. (2010). Cannabis use and the course of schizophrenia: 10-year follow-up after first hospitalization. *American Journal of Psychiatry*. <https://doi.org/10.1176/appi.ajp.2010.09020189>
14. Gilmore, J. H. (2010). Understanding What Causes Schizophrenia: A Developmental Perspective. *American Journal of Psychiatry*. <https://doi.org/10.1176/appi.ajp.2009.09111588>
15. Gilmore, J. H. (2010). Understanding What Causes Schizophrenia: A Developmental Perspective. *American Journal of Psychiatry*. <https://doi.org/10.1176/appi.ajp.2009.09111588>
16. Green, M. F., & Harvey, P. D. (2014). Cognition in schizophrenia: Past, present, and future. *Schizophrenia Research: Cognition*. <https://doi.org/10.1016/j.scog.2014.02.001>
17. Green, M. F., & Harvey, P. D. (2014). Cognition in schizophrenia: Past, present, and future. *Schizophrenia Research: Cognition*. <https://doi.org/10.1016/j.scog.2014.02.001>
18. Hakansson, K., Rovio, S., Helkala E.L., Vilska, A., Winblad, B., . . . Kivipelto, M. (2009). Association between mid-life marital status and cognitive function in later life: population based cohort study. *BMJ*. Doi: 10.1136/bmj.b2462
19. Hakansson, K., Rovio, S., Helkala E.L., Vilska, A., Winblad, B., . . . Kivipelto, M. (2009). Association between mid-life marital status and cognitive function in later life: population based cohort study. *BMJ*. Doi: 10.1136/bmj.b2462
20. Hsieh, S., McGrory, S., Leslie, F., Dawson, K., Ahmed, S., Butler, C. R., ... Hodges, J. R. (2015). The mini-addenbrooke's cognitive examination: A new assessment tool for dementia. *Dementia and Geriatric Cognitive Disorders*. <https://doi.org/10.1159/000366040>.
21. Hsieh, S., McGrory, S., Leslie, F., Dawson, K., Ahmed, S., Butler, C. R., ... Hodges, J. R. (2015). The mini-addenbrooke's cognitive examination: A new assessment tool for dementia. *Dementia and Geriatric Cognitive Disorders*. <https://doi.org/10.1159/000366040>
22. Hughes, C., Kumari, V., Das, M., Zachariah, E., Ettinger, U., Sumich, A., & Sharma, T. (2005). Cognitive functioning in siblings discordant for schizophrenia. *Acta Psychiatrica Scandinavica*. <https://doi.org/10.1111/j.1600-0447.2004.00392.x>
23. Hughes, C., Kumari, V., Das, M., Zachariah, E., Ettinger, U., Sumich, A., & Sharma, T. (2005). Cognitive functioning in siblings discordant for schizophrenia. *Acta Psychiatrica Scandinavica*. <https://doi.org/10.1111/j.1600-0447.2004.00392.x>
24. Kaneda, A., Katagai, T., & Yasui-Furukori, N. (2013). Comparing the influences of age and disease on the brief assessment of cognition in schizophrenia in Japanese patients with schizophrenia. *Neuropsychiatric Disease and Treatment*. <https://doi.org/10.2147/NDT.S43280>
25. Kaneda, A., Katagai, T., & Yasui-Furukori, N. (2013). Comparing the influences of age and disease on the brief assessment of cognition in schizophrenia in Japanese patients with schizophrenia. *Neuropsychiatric Disease and Treatment*. <https://doi.org/10.2147/NDT.S43280>
26. Karila, L., Roux, P. Benjamin, R., Benyamina, A., . . . (2014). Acute and long term effects of cannabis use: a review. *Current pharmaceutical design* 20 (25), 4112-4118.
27. Karila, L., Roux, P. Benjamin, R., Benyamina, A., . . . (2014). Acute and long term effects of cannabis use: a review. *Current pharmaceutical design* 20 (25), 4112-4118.
28. Keefe, R. S. E., & Harvey, P. D. (2012). Cognitive impairment in schizophrenia. *Handbook of Experimental Pharmacology*. https://doi.org/10.1007/978-3-642-25758-2_2
29. Keefe, R. S. E., & Harvey, P. D. (2012). Cognitive impairment in schizophrenia. *Handbook of Experimental Pharmacology*. https://doi.org/10.1007/978-3-642-25758-2_2
30. Kurtz, M. M., Gopal, S., John, S., & Thara, R. (2018). Cognition, social cognition and functional disability in early-stage schizophrenia: A study from southern India. *Psychiatry Research*, 265(July 2017), 231–237. <https://doi.org/10.1016/j.psychres.2018.03.091>
31. Kurtz, M. M., Gopal, S., John, S., & Thara, R. (2018). Cognition, social cognition and functional disability in early-stage schizophrenia: A study from southern India. *Psychiatry Research*, 265(July 2017), 231–237. <https://doi.org/10.1016/j.psychres.2018.03.091>
32. Li, X. J., Wu, J. H., Liu, J. B., Li, K. P., Wang, F., Sun, X. H., & Ma, S. H. (2015). The influence of marital status on the social dysfunction of schizophrenia patients in community. *International Journal of Nursing Sciences*. <https://doi.org/10.1016/j.ijnss.2015.04.015>
33. Li, X. J., Wu, J. H., Liu, J. B., Li, K. P., Wang, F., Sun, X. H., & Ma, S. H. (2015). The influence of marital status on the social dysfunction of schizophrenia patients in community. *International Journal of Nursing Sciences*. <https://doi.org/10.1016/j.ijnss.2015.04.015>
34. Merhej, G., Hallit, S., Haddad, C., Hachem, D., & Haddad, G. (2017). Neurological soft signs in Schizophrenia: Gender differences and promising suggestions. *Journal of Psychopathology*.
35. Merhej, G., Hallit, S., Haddad, C., Hachem, D., & Haddad, G. (2017). Neurological soft signs in Schizophrenia: Gender differences and promising suggestions. *Journal of Psychopathology*.
36. Nyer, M., Kasckow, J., Fellows, Di., Lawrence, E. C., Golshan, S., Solorzano, E., & Zisook, S. (2010). The relationship of marital status and clinical characteristics in middle-aged and older patients with schizophrenia and depressive symptoms. *Annals of Clinical Psychiatry*.

37. Nyer, M., Kasckow, J., Fellows, Di., Lawrence, E. C., Golshan, S., Solorzano, E., & Zisook, S. (2010). The relationship of marital status and clinical characteristics in middle-aged and older patients with schizophrenia and depressive symptoms. *Annals of Clinical Psychiatry*.
38. Patrick, D.L., Burns, T., Morosini, P., Rothman, M., Gagnon, D. D., Wild, D., & Adriaenssen, I. (2009). Reability, validity and ability to detect change of clinician-rated Personal and Social Performance scale in patients with acute symptoms of schizophrenia. *Current Medical research and Opinion*, 25(2), 325-338. Doi:10.1185/03007990802611919.
39. Patrick, D.L., Burns, T., Morosini, P., Rothman, M., Gagnon, D. D., Wild, D., & Adriaenssen, I. (2009). Reability, validity and ability to detect change of clinician-rated Personal and Social Performance scale in patients with acute symptoms of schizophrenia. *Current Medical research and Opinion*, 25(2), 325-338. Doi:10.1185/03007990802611919.
40. Radhakrishnan, R., Wilkinson, S. T., & D'Souza, D. C. (2014). Gone to pot-a review of the association between cannabis and psychosis. *Frontiers in Psychiatry*, 5(MAY), 1–24. <https://doi.org/10.3389/fpsy.2014.00054>.
41. Radhakrishnan, R., Wilkinson, S. T., & D'Souza, D. C. (2014). Gone to pot-a review of the association between cannabis and psychosis. *Frontiers in Psychiatry*, 5(MAY), 1–24. <https://doi.org/10.3389/fpsy.2014.00054>.
42. Rajji, T. K., Voineskos, A. N., Butters, M. A., Miranda, D., Arenovich, T., Menon, M., ... Mulsant, B. H. (2013). Cognitive performance of individuals with schizophrenia across seven decades: A study using the MATRICS consensus cognitive battery. *American Journal of Geriatric Psychiatry*. <https://doi.org/10.1016/j.jagp.2012.10.011>.
43. Rajji, T. K., Voineskos, A. N., Butters, M. A., Miranda, D., Arenovich, T., Menon, M., ... Mulsant, B. H. (2013). Cognitive performance of individuals with schizophrenia across seven decades: A study using the MATRICS consensus cognitive battery. *American Journal of Geriatric Psychiatry*. <https://doi.org/10.1016/j.jagp.2012.10.011>.
44. Talreja, B., Kataria, L., & Shah, S. (2013). Cognitive function in schizophrenia and its association with socio-demographics factors. *Industrial Psychiatry Journal*. <https://doi.org/10.4103/0972-6748.123619>
45. Talreja, B., Kataria, L., & Shah, S. (2013). Cognitive function in schizophrenia and its association with socio-demographics factors. *Industrial Psychiatry Journal*. <https://doi.org/10.4103/0972-6748.123619>
46. Veling, W., Hoek, H. W., Wiersma, D., & MacKenbach, J. P. (2010). Ethnic identity and the risk of schizophrenia in ethnic minorities: A case-control study. *Schizophrenia Bulletin*. <https://doi.org/10.1093/schbul/sbp032>
47. Veling, W., Hoek, H. W., Wiersma, D., & MacKenbach, J. P. (2010). Ethnic identity and the risk of schizophrenia in ethnic minorities: A case-control study. *Schizophrenia Bulletin*. <https://doi.org/10.1093/schbul/sbp032>.
48. Weickert, C. S., & Weickert, T. W. (2016). Hormone modulation improves cognition in schizophrenia. *Neuropsychopharmacology*, 41(1), 384–385. <https://doi.org/10.1038/npp.2015.269>
49. Weickert, C. S., & Weickert, T. W. (2016). Hormone modulation improves cognition in schizophrenia. *Neuropsychopharmacology*, 41(1), 384–385. <https://doi.org/10.1038/npp.2015.269>.