

BÖLÜM 3



Küresel Salgın Döneminde Psikotik Bozukluklar ve Bipolar Bozukluklar

Çağrı ÖĞÜT¹

Yeni koronovirüs hastalığı (COVID-19) salgını 2019 yılından beri dünya çapında devam etmekte ve halen küresel bir sağlık sorunu olarak kabul edilmektedir. 8 Mayıs 2022 tarihi itibarı ile küresel çapta COVID-19'a yakalanan vaka sayısı 514 milyonu geçmişken, 6 milyonun üzerinde hasta hayatını kaybetmiştir (1). TC Sağlık Bakanlığının COVID-19 Bilgilendirme Platformu'ndan alınan bilgiye göre bu süreçte ülkemizde de yaklaşık 15 milyon kişi COVID-19 enfeksiyonuna yakalanmış ve 100 bin kişi COVID-19 nedeniyle hayatını kaybetmiştir (2). Ülkemizde salgın son dönemde hızını azaltsa da, halen haftalık yaklaşık beş bin kişi COVID-19 pozitif saptanmaya ve haftalık yaklaşık 600 kişi salgın nedeniyle hayatını kaybetmeye devam etmektedir (2). Üstelik Dünya Sağlık Örgütü (DSÖ), dünyanın farklı bölgelerinde vaka sayılarında artışın devam ettiğini bildirmektedir (1).

¹ Dr. Öğr. Üyesi, Uşak Üniversitesi Tıp Fakültesi Ruh Sağlığı ve Hastalıkları AD., cagri_ogut@hotmail.com.



icin kullanılan ilaçların iyatrojenik etkisi, COVID-19 kaynaklı psikozun olası mekanizmaları olarak bildirilmiştir. Ancak eldeki veriler bu konuda kesin bir kanaat oluşturacak düzeyde değildir.

Kaynaklar

1. Dünya Sağlık Örgütü. *Weekly epidemiological update on COVID-19-11 May 2022.* (15.05.2022 tarihinde <https://www.who.int/publications/item/weekly-epidemiological-update-on-covid-19---11-may-2022> adresinden ulaşılmıştır).
2. TC. Sağlık Bakanlığı. *COVID-19 Bilgilendirme Platformu.* (15.05.2022 tarihinde <https://covid19.saglik.gov.tr/> adresinden ulaşılmıştır).
3. Aminoff SR, Mork E, Barrett EA, Simonsen C, Ten Velden Hegelstad W, Lagerberg TV, et al. Locked out during COVID-19 lockdown—an online survey of relatives of people with psychotic and bipolar disorders in Norway. *BMC Public Health.* 2022;22(1):294.
4. Barrett EA, Simonsen C, Aminoff SR, Hegelstad WTV, Lagerberg TV, Melle I, et al. The COVID-19 pandemic impact on wellbeing and mental health in people with psychotic and bipolar disorders. *Brain Behav.* 2022;12(5):e2559.
5. Heron P, Spanakis P, Crosland S, Johnston G, Newbronner E, Wadman R, et al. Loneliness among people with severe mental illness during the COVID-19 pandemic: Results from a linked UK population cohort study. *PLoS One.* 2022;17(1):e0262363.
6. Pinkham AE, Ackerman RA, Depp CA, Harvey PD, Moore RC. A Longitudinal Investigation of the Effects of the COVID-19 Pandemic on the Mental Health of Individuals with Pre-existing Severe Mental Illnesses. *Psychiatry Res.* 2020;294:113493.
7. Romm KL, Rossberg JI, Berg AO, Barrett EA, Faerden A, Agartz I, et al. Depression and depressive symptoms in first episode psychosis. *J Nerv Ment Dis.* 2010;198(1):67-71.
8. Simonsen C, Sundet K, Vaskinn A, Birkenaes AB, Engh JA, Faerden A, et al. Neurocognitive dysfunction in bipolar and schizophrenia spectrum disorders depends on history of psychosis rather than diagnostic group. *Schizophr Bull.* 2011;37(1):73-83.
9. Balaban OD, Yildizhan E, Atbasoglu EC. Two Faces of Chronic Mental Disorders in a Changing World: Schizophrenia and Bipolar Disorder. *Noro Psikiyatrv Ars.* 2021;58(Suppl 1):S1-S2.
10. Mohan M, Perry BI, Saravanan P, Singh SP. COVID-19 in People With Schizophrenia: Potential Mechanisms Linking Schizophrenia to Poor Prognosis. *Front Psychiatry.* 2021;12:666067.



11. Cho SJ, Kim J, Kang YJ, Lee SY, Seo HY, Park JE, et al. Annual Prevalence and Incidence of Schizophrenia and Similar Psychotic Disorders in the Republic of Korea: A National Health Insurance Data-Based Study. *Psychiatry Investig.* 2020;17(1):61-70.
12. Ji W, Huh K, Kang M, Hong J, Bae GH, Lee R, et al. Effect of Underlying Comorbidities on the Infection and Severity of COVID-19 in Korea: a Nationwide Case-Control Study. *J Korean Med Sci.* 2020;35(25):e237.
13. Fond G, Pauly V, Leone M, Llorca PM, Orleans V, Loundou A, et al. Disparities in Intensive Care Unit Admission and Mortality Among Patients With Schizophrenia and COVID-19: A National Cohort Study. *Schizophr Bull.* 2021;47(3):624-34.
14. Wang Q, Xu R, Volkow ND. Increased risk of COVID-19 infection and mortality in people with mental disorders: analysis from electronic health records in the United States. *World Psychiatry.* 2021;20(1):124-30.
15. Tzur Bitan D, Krieger I, Kridin K, Komantscher D, Scheinman Y, Weinstein O, et al. COVID-19 Prevalence and Mortality Among Schizophrenia Patients: A Large-Scale Retrospective Cohort Study. *Schizophr Bull.* 2021;47(5):1211-7.
16. Ceban F, Nogo D, Carvalho IP, Lee Y, Nasri F, Xiong J, et al. Association Between Mood Disorders and Risk of COVID-19 Infection, Hospitalization, and Death: A Systematic Review and Meta-analysis. *JAMA Psychiatry.* 2021;78(10):1079-91.
17. Druss BG. Addressing the COVID-19 Pandemic in Populations With Serious Mental Illness. *JAMA Psychiatry.* 2020;77(9):891-2.
18. Tsai J, Wilson M. COVID-19: a potential public health problem for homeless populations. *Lancet Public Health.* 2020;5(4):e186-e7.
19. Brody BD, Shi Z, Shaffer C, Eden D, Wyka K, Alexopoulos GS, et al. COVID-19 infection rates in patients referred for psychiatric admission during a regional surge: The case for universal testing. *Psychiatry Res.* 2021;298:113833.
20. Spitzer Sverd S, Gardner LE, Cabassa JA, Schneider M, Noone RH, Jahdi MH, et al. A Bronx tale: Exposure, containment and care on inpatient psychiatry units during COVID-19. *Gen Hosp Psychiatry.* 2021;69:121-3.
21. Maguire PA, Reay RE, Looi JC. Nothing to sneeze at - uptake of protective measures against an influenza pandemic by people with schizophrenia: willingness and perceived barriers. *Australas Psychiatry.* 2019;27(2):171-8.
22. Zhand N, Joober R. Implications of the COVID-19 pandemic for patients with schizophrenia spectrum disorders: narrative review. *BJPsych Open.* 2021;7(1):e35.
23. Vaccari P, Ramirez-Vielma R, Saldivia S, Cova F, Vielma-Aguilera A, Victoriano V, et al. Stigma towards people with a diagnosis of severe



- mental disorder in primary healthcare centers: perspectives of service users and health teams in Chile. *Int J Ment Health Syst.* 2020;14:6.
- 24. Henderson C, Evans-Lacko S, Thornicroft G. Mental illness stigma, help seeking, and public health programs. *Am J Public Health.* 2013;103(5):777-80.
 - 25. Shim R, Rust G. Primary care, behavioral health, and public health: partners in reducing mental health stigma. *Am J Public Health.* 2013;103(5):774-6.
 - 26. Lawrence D, Kisely S. Inequalities in healthcare provision for people with severe mental illness. *J Psychopharmacol.* 2010;24(4 Suppl):61-8.
 - 27. Reilly S, Olier I, Planner C, Doran T, Reeves D, Ashcroft DM, et al. Inequalities in physical comorbidity: a longitudinal comparative cohort study of people with severe mental illness in the UK. *BMJ Open.* 2015;5(12):e009010.
 - 28. Toalson P, Ahmed S, Hardy T, Kabinoff G. The Metabolic Syndrome in Patients With Severe Mental Illnesses. *Prim Care Companion J Clin Psychiatry.* 2004;6(4):152-8.
 - 29. Muller N, Weidinger E, Leitner B, Schwarz MJ. The role of inflammation in schizophrenia. *Front Neurosci.* 2015;9:372.
 - 30. Rodrigues-Amorim D, Rivera-Baltanas T, Spuch C, Caruncho HJ, Gonzalez-Fernandez A, Olivares JM, et al. Cytokines dysregulation in schizophrenia: A systematic review of psychoneuroimmune relationship. *Schizophr Res.* 2018;197:19-33.
 - 31. Watson CJ, Thomas RH, Solomon T, Michael BD, Nicholson TR, Polak TA. COVID-19 and psychosis risk: Real or delusional concern? *Neurosci Lett.* 2021;741:135491.
 - 32. Petrilli CM, Jones SA, Yang J, Rajagopalan H, O'Donnell L, Chernyak Y, et al. Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BMJ.* 2020;369:m1966.
 - 33. Sayana P, Colpo GD, Simoes LR, Giridharan VV, Teixeira AL, Quevedo J, et al. A systematic review of evidence for the role of inflammatory biomarkers in bipolar patients. *J Psychiatr Res.* 2017;92:160-82.
 - 34. Luykx JJ, Lin BD. Are psychiatric disorders risk factors for COVID-19 susceptibility and severity? a two-sample, bidirectional, univariable, and multivariable Mendelian Randomization study. *Transl Psychiatry.* 2021;11(1):210.
 - 35. Nadalin S, Jakovac H, Peitl V, Karlovic D, Buretic-Tomljanovic A. Dysregulated inflammation may predispose patients with serious mental illnesses to severe COVID19 (Review). *Mol Med Rep.* 2021;24(2).
 - 36. Rigat B, Hubert C, Alhenc-Gelas F, Cambien F, Corvol P, Soubrier F. An insertion/deletion polymorphism in the angiotensin I-converting



- enzyme gene accounting for half the variance of serum enzyme levels. *J Clin Invest.* 1990;86(4):1343-6.
- 37. Bellone M, Calvisi SL. ACE polymorphisms and COVID-19-related mortality in Europe. *J Mol Med (Berl).* 2020;98(11):1505-9.
 - 38. Kucukali CI, Aydin M, Ozkok E, Bilge E, Zengin A, Cakir U, et al. Angiotensin-converting enzyme polymorphism in schizophrenia, bipolar disorders, and their first-degree relatives. *Psychiatr Genet.* 2010;20(1):14-9.
 - 39. Mazaheri H, Saadat M. Association between Insertion/Deletion Polymorphism in Angiotension Converting Enzyme and Susceptibility to Schizophrenia. *Iran J Public Health.* 2015;44(3):369-73.
 - 40. Hui L, Wu JQ, Zhang X, Lv J, Du WL, Kou CG, et al. Association between the angiotensin-converting enzyme gene insertion/deletion polymorphism and first-episode patients with schizophrenia in a Chinese Han population. *Hum Psychopharmacol.* 2014;29(3):274-9.
 - 41. Dratcu L, Boland X. Can antipsychotic use protect from COVID-19? *Schizophr Res.* 2021;236:1-2.
 - 42. Girgis RR, Lieberman JA. Anti-viral properties of antipsychotic medications in the time of COVID-19. *Psychiatry Res.* 2021;295:113626.
 - 43. Nemanic K, Williams SZ, Olfson M, Leckman-Westin E, Finnerty M, Kammer J, et al. Association Between the Use of Psychotropic Medications and the Risk of COVID-19 Infection Among Long-term Inpatients With Serious Mental Illness in a New York State-wide Psychiatric Hospital System. *JAMA Netw Open.* 2022;5(5):e2210743.
 - 44. Vai B, Mazza MG, Delli Colli C, Foiselle M, Allen B, Benedetti F, et al. Mental disorders and risk of COVID-19-related mortality, hospitalisation, and intensive care unit admission: a systematic review and meta-analysis. *Lancet Psychiatry.* 2021;8(9):797-812.
 - 45. Vai B, Mazza MG. Antipsychotics and COVID-19 Outcomes-The Potential Role of the Clinical Setting? *JAMA Netw Open.* 2022;5(5):e2210749.
 - 46. Marder SR, Cannon TD. Schizophrenia. *N Engl J Med.* 2019;381(18):1753-61.
 - 47. Polat A, Cakir U, Gunduz N. Leukocytosis after Clozapine Treatment in a Patient with Chronic Schizophrenia. *Noro Psikiyatr Ars.* 2016;53(1):87-8.
 - 48. Lee J, Taneja V, Vassallo R. Cigarette smoking and inflammation: cellular and molecular mechanisms. *J Dent Res.* 2012;91(2):142-9.
 - 49. Cattaruzza MS, Zaga V, Gallus S, D'Argenio P, Gorini G. Tobacco smoking and COVID-19 pandemic: old and new issues. A summary of the evidence from the scientific literature. *Acta Biomed.* 2020;91(2):106-12.

50. Clift AK, von Ende A, Tan PS, Sallis HM, Lindson N, Coupland CAC, et al. Smoking and COVID-19 outcomes: an observational and Mendelian randomisation study using the UK Biobank cohort. *Thorax*. 2022;77(1):65-73.
51. Kumar A, Nayar KR. COVID 19 and its mental health consequences. *J Ment Health*. 2021;30(1):1-2.
52. Fleischmann E, Dalkner N, Fellendorf FT, Reininghaus EZ. Psychological impact of the COVID-19 pandemic on individuals with serious mental disorders: A systematic review of the literature. *World J Psychiatry*. 2021;11(12):1387-406.
53. Gonzalez-Blanco L, Dal Santo F, Garcia-Alvarez L, de la Fuente-Tomas L, Moya Lacasa C, Paniagua G, et al. COVID-19 lockdown in people with severe mental disorders in Spain: Do they have a specific psychological reaction compared with other mental disorders and healthy controls? *Schizophr Res*. 2020;223:192-8.
54. Liu X, Lin H, Jiang H, Li R, Zhong N, Su H, et al. Clinical characteristics of hospitalised patients with schizophrenia who were suspected to have coronavirus disease (COVID-19) in Hubei Province, China. *Gen Psychiatr*. 2020;33(2):e100222.
55. Van Rheenen TE, Meyer D, Neill E, Phillipou A, Tan EJ, Toh WL, et al. Mental health status of individuals with a mood-disorder during the COVID-19 pandemic in Australia: Initial results from the COLLATE project. *J Affect Disord*. 2020;275:69-77.
56. Muruganandam P, Neelamegam S, Menon V, Alexander J, Chaturvedi SK. COVID-19 and Severe Mental Illness: Impact on patients and its relation with their awareness about COVID-19. *Psychiatry Res*. 2020;291:113265.
57. Riblet NB, Stevens SP, Shiner B, Cornelius S, Forehand J, Scott RC, et al. Longitudinal Examination of COVID-19 Public Health Measures on Mental Health for Rural Patients With Serious Mental Illness. *Mil Med*. 2021;186(9-10):e956-e61.
58. Mutlu E, Anil Yagcioglu AE. Relapse in patients with serious mental disorders during the COVID-19 outbreak: a retrospective chart review from a community mental health center. *Eur Arch Psychiatry Clin Neurosci*. 2021;271(2):381-3.
59. Leigh-Hunt N, Baggaley D, Bash K, Turner V, Turnbull S, Valtorta N, et al. An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health*. 2017;152:157-71.
60. Santini ZI, Koyanagi A, Tyrovolas S, Mason C, Haro JM. The association between social relationships and depression: a systematic review. *J Affect Disord*. 2015;175:53-65.
61. Stuart S, Robertson M. *Kişilerarası İlişkiler Psikoterapisi Klinisyen Klavuzu*. İstanbul: Yerküre Tanıtım ve Yayıncılık AŞ.; 2014.



62. Ma J, Hua T, Zeng K, Zhong B, Wang G, Liu X. Influence of social isolation caused by coronavirus disease 2019 (COVID-19) on the psychological characteristics of hospitalized schizophrenia patients: a case-control study. *Transl Psychiatry.* 2020;10(1):411.
63. Alle MC, Berntsen D. Self-isolation, psychotic symptoms and cognitive problems during the COVID-19 worldwide outbreak. *Psychiatry Res.* 2021;302:114015.
64. Brenner MH, Bhugra D. Acceleration of Anxiety, Depression, and Suicide: Secondary Effects of Economic Disruption Related to COVID-19. *Front Psychiatry.* 2020;11:592467.
65. Rajkumar RP. Bipolar disorder, COVID-19, and the risk of relapse. *Bipolar Disord.* 2020;22(6):640.
66. Dünya Sağlık Örgütü. *The impact of COVID-19 on mental, neurological and substance use services: results of a rapid assessment.* (07.01.2020 tarihinde <https://www.who.int/publications/item/978924012455> adresinden ulaşılmıştır).
67. Tham WW, Sojli E, Bryant R, McAleer M. Common Mental Disorders and Economic Uncertainty: Evidence from the COVID-19 Pandemic in the U.S. *PLoS One.* 2021;16(12):e0260726.
68. Başar K, Bilici R. Küresel salgın döneminde ruh sağlığı hizmetlerinin örgütlenmesi: Güncel bilginin uygulamaya yansıtılması ve hizmetin düzenlenmesi, eşgündümü. *Psikiyatride Güncel.* 2022;12(2):115-29.
69. Mutlu E. Küresel salgın döneminde ayakta ruh sağlığı hizmetlerinin yürütülmesi, ilkeler, zorluklar ve çözüm önerileri. *Psikiyatride Güncel.* 2022;12(2):142-52.
70. Hernandez-Gomez A, Andrade-Gonzalez N, Lahera G, Vieta E. Recommendations for the care of patients with bipolar disorder during the COVID-19 pandemic. *J Affect Disord.* 2021;279:117-21.
71. Murray A. Heightened risk factors in the midst of the pandemic: Supporting individuals with psychosis during COVID-19. *Perspect Psychiatr Care.* 2022;58(1):164-9.
72. Hu W, Su L, Li D, Zhou Y, Zhu J. Risk of First-Episode Schizophrenia in Aged Adults Increased During COVID-19 Outbreak. *Int J Ment Health Addict.* 2021;1-11.
73. Varatharaj A, Thomas N, Ellul MA, Davies NWS, Pollak TA, Tenorio EL, et al. Neurological and neuropsychiatric complications of COVID-19 in 153 patients: a UK-wide surveillance study. *Lancet Psychiatry.* 2020;7(10):875-82.
74. Taquet M, Geddes JR, Husain M, Luciano S, Harrison PJ. 6-month neurological and psychiatric outcomes in 236 379 survivors of COVID-19: a retrospective cohort study using electronic health records. *Lancet Psychiatry.* 2021;8(5):416-27.



75. Smith CM, Gilbert EB, Riordan PA, Helmke N, von Isenburg M, Kincaid BR, et al. COVID-19-associated psychosis: A systematic review of case reports. *Gen Hosp Psychiatry*. 2021;73:84-100.
76. Parra A, Juanes A, Losada CP, Alvarez-Sesmero S, Santana VD, Martí I, et al. Psychotic symptoms in COVID-19 patients. A retrospective descriptive study. *Psychiatry Res*. 2020;291:113254.
77. Rentero D, Juanes A, Losada CP, Alvarez S, Parra A, Santana V, et al. New-onset psychosis in COVID-19 pandemic: a case series in Madrid. *Psychiatry Res*. 2020;290:113097.
78. Al-Busaidi S, Al Huseini S, Al-Shehhi R, Zishan AA, Moghadas M, Al-Adawi S. COVID-19 Induced New-onset Psychosis: A Case Report from Oman. *Oman Med J*. 2021;36(5):e303.
79. Alba L, Coll C, Saez S, Alonso L, Perez H, Palma S, et al. New-onset psychosis: A case report of brief psychosis related to COVID-19 infection. *Psychiatry Res*. 2021;301:113975.
80. Bakre S, Chugh K, Oke O, Kablinger A. COVID-19 Induced Brief Psychotic Disorder: A Case Report and Review of Literature. *Case Rep Psychiatry*. 2022;2022:9405630.
81. Faisal HKP, Taufik FF, Sugihen TTG, Prasenohadi, Juliani T, Yunus F. Brief psychotic disorder in COVID-19 patient with no history of mental illness. *J Infect Dev Ctries*. 2021;15(6):787-90.
82. Los K, Kulikowska J, Waszkiewicz N. First-Time Psychotic Symptoms in a Patient After COVID-19 Infection-A Case Report. *Front Psychiatry*. 2021;12:726059.
83. Smith CM, Komisar JR, Mourad A, Kincaid BR. COVID-19-associated brief psychotic disorder. *BMJ Case Rep*. 2020;13(8).
84. Chacko M, Job A, Caston F, 3rd, George P, Yacoub A, Caceda R. COVID-19-Induced Psychosis and Suicidal Behavior: Case Report. *SN Compr Clin Med*. 2020;2(11):2391-5.
85. Yesilkaya UH, Sen M, Karamustafalioglu N. New variants and new symptoms in COVID-19: First episode psychosis and Cotard's Syndrome two months after infection with the B.1.1.7 variant of coronavirus. *Schizophr Res*. 2022;243:315-6.
86. Finatti F, Pigati G, Pavan C, Toffanin T, Favaro A. Psychosis in Patients in COVID-19-Related Quarantine: A Case Series. *Prim Care Companion CNS Disord*. 2020;22(3).
87. Oloniniyi IO, Ibigbami OI, Amiola A, Esan OA, Esan OO. First Episode Psychosis during COVID-19 Pandemic: A Case Series. *West Afr J Med*. 2021;38(6):599-603.
88. Sunbul EA, Cavusoglu EC, Gulec H. Brief psychotic disorder during COVID-19 pandemic: A case series. *Indian J Psychiatry*. 2021;63(5):508-10.



89. Valdes-Florido MJ, Lopez-Diaz A, Palermo-Zeballos FJ, Martinez-Molina I, Martin-Gil VE, Crespo-Facorro B, et al. Reactive psychoses in the context of the COVID-19 pandemic: Clinical perspectives from a case series. *Rev Psiquiatr Salud Ment (Engl Ed)*. 2020;13(2):90-4.
90. Rittmannsberger H, Barth M, Malik P, Malsiner-Walli G, Yazdi K. First-episode psychotic disorders in the wake of the COVID-19 pandemic: a descriptive review of casereports. *Acta Neuropsychiatr*. 2022;1-22.
91. Los K, Kulikowska J, Waszkiewicz N. The Impact of the COVID-19 Virus Pandemic on the Incidence of First Psychotic Spectrum Disorders. *Int J Environ Res Public Health*. 2022;19(7).
92. Stompe T, Ortwein-Swoboda G, Ritter K, Schanda H. Old wine in new bottles? Stability and plasticity of the contents of schizophrenic delusions. *Psychopathology*. 2003;36(1):6-12.
93. Ovejero S, Baca-Garcia E, Barrigon ML. Coronavirus infection as a novel delusional topic. *Schizophr Res*. 2020;222:541-2.
94. Shailaja B, Adarsh B, Chaudhury S. Weaved around COVID-19: Case series of coronavirus thematic delusions. *Ind Psychiatry J*. 2021;30(2):356-60.
95. Shanbour A, Khalid Z, Fana M. Psychosis and Infodemic Isolation Resulting in First Inpatient Hospitalization During the COVID-19 Pandemic A Case Series. *Prim Care Companion CNS Disord*. 2020;22(3).
96. Steardo L, Jr., Steardo L, Verkhratsky A. Psychiatric face of COVID-19. *Transl Psychiatry*. 2020;10(1):261.
97. Boldrini M, Canoll PD, Klein RS. How COVID-19 Affects the Brain. *JAMA Psychiatry*. 2021;78(6):682-3.
98. Almqvist J, Granberg T, Tzortzakakis A, Klironomos S, Kollia E, Ohberg C, et al. Neurological manifestations of coronavirus infections - a systematic review. *Ann Clin Transl Neurol*. 2020;7(10):2057-71.
99. Solomon IH, Normandin E, Bhattacharyya S, Mukerji SS, Keller K, Ali AS, et al. Neuropathological Features of Covid-19. *N Engl J Med*. 2020;383(10):989-92.
100. Toscano G, Palmerini F, Ravaglia S, Ruiz L, Invernizzi P, Cuzzoni MG, et al. Guillain-Barre Syndrome Associated with SARS-CoV-2. *N Engl J Med*. 2020;382(26):2574-6.
101. Parsons T, Banks S, Bae C, Gelber J, Alahmadi H, Tichauer M. COVID-19-associated acute disseminated encephalomyelitis (ADEM). *J Neurol*. 2020;267(10):2799-802.
102. McAlpine LS, Lifland B, Check JR, Angarita GA, Ngo TT, Pleasure SJ, et al. Remission of Subacute Psychosis in a COVID-19 Patient With an Antineuronal Autoantibody After Treatment With Intravenous Immunoglobulin. *Biol Psychiatry*. 2021;90(4):e23-e6.



103. Goldsmith DR, Rapaport MH, Miller BJ. A meta-analysis of blood cytokine network alterations in psychiatric patients: comparisons between schizophrenia, bipolar disorder and depression. *Mol Psychiatry*. 2016;21(12):1696-709.
104. Miller BJ, Buckley P, Seabolt W, Mellor A, Kirkpatrick B. Meta-analysis of cytokine alterations in schizophrenia: clinical status and antipsychotic effects. *Biol Psychiatry*. 2011;70(7):663-71.
105. van Winkel R, Stefanis NC, Myin-Germeys I. Psychosocial stress and psychosis. A review of the neurobiological mechanisms and the evidence for gene-stress interaction. *Schizophr Bull*. 2008;34(6):1095-105.
106. Grolli RE, Mingoti MED, Bertollo AG, Luzardo AR, Quevedo J, Reus GZ, et al. Impact of COVID-19 in the Mental Health in Elderly: Psychological and Biological Updates. *Mol Neurobiol*. 2021;58(5):1905-16.
107. Beards S, Gayer-Anderson C, Borges S, Dewey ME, Fisher HL, Morgan C. Life events and psychosis: a review and meta-analysis. *Schizophr Bull*. 2013;39(4):740-7.
108. Lee DT, Wing YK, Leung HC, Sung JJ, Ng YK, Yiu GC, et al. Factors associated with psychosis among patients with severe acute respiratory syndrome: a case-control study. *Clin Infect Dis*. 2004;39(8):1247-9.
109. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry*. 2020;7(7):611-27.