

BÖLÜM 13

ÇOCUK VE ERGENLERDE NREM UYKUSU UYANMA BOZUKLUKLARI

Ceren EVCEN JANBAKHISHOV¹

Giriş

Uyku emosyonel, bilişsel, fiziksel ve gelişimsel sağlık için kritik role sahiptir. Çocuk ve ergende uyku bozukluklarının, anksiyete, duygudurum, madde kullanım bozuklukları ve suicidal davranışlar gibi pek çok psikiyatrik durum için risk faktörü olduğu saptanmıştır (1, 2). Bu bölümde incelenecek olan hızlı göz hareketleri olmayan (Non-rapid eye movement, NREM) uyku parasomnileri, aynı zamanda *NREM uykusu uyanma (arousal) bozukluğu* olarak da adlandırılmaktadır. NREM parasomnileri, hem Amerikan Psikiyatri Derneği'nin 2022'de yayınlanan Mental Bozuklukların Tanısal ve İstatistiksel El Kitabı gözden geçirilmiş beşinci baskısında (Diagnostic and Statistical Manual of Mental Disorders-5 Text Revision, DSM-5 TRTM) hem de Amerikan Uyku Tıbbı Akademisi'nin (American Academy of Sleep Medicine, AASM) Uluslararası Uyku Bozuklukları Sınıflandırması'nın son olarak 2014'te revize edilmiş üçüncü baskısında (International Classification of Sleep Disorders, ICSD-3) parasomniler başlığı altında yer almaktadır (3, 4). Geçmişte, uyku bozuklukları için farklı sınıflandırma sistemleri arasında sadece kısmi bir anlaşma varken, son revizyonlarla tanı kriterleri daha uyumlu hâle getirilmeye çalışılmış, yaşa uygun belirteçler de eklenmiştir. Halihazırda DSM-5 TRTM ile ICSD-3 tanı kriterleri daha uyumludur. ICSD-3, uyku uzmanlarına yönelik olduğu için daha fazla ayrıntı içerirken, DSM-5 TRTM'deki klinik olarak anlamlı diğer değişiklik, uyku bozuklukları ve psikiyatrik bozuklukların aynı anda teş-

¹ Uzm Dr, Fetal Merkez NS Genetics Bakü-Azerbaycan, crn_evcen@hotmail.com



Kaynaklar

1. Gregory AM, Sadeh A. Annual Research Review: sleep problems in childhood psychiatric disorders—a review of the latest science. *Journal of Child Psychology and Psychiatry* 2015;57:296–317. doi:10.1111/jcpp.12469
2. Owens J. Insufficient sleep in adolescents and young adults: an update on causes and consequences. *Pediatrics* 2014;134(3):921–932.
3. American Psychiatric Association. (2022). Diagnostic and Statistical Manual of Mental Disorders Fifth Edition Text Revision (DSM-5-TR™). 5th ed. Washington, DC.
4. American Academy of Sleep Medicine. (2014). International Classification of Sleep Disorders. 3rd ed. Darien, IL: American Academy of Sleep Medicine,
5. Zero To Three: Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood: Revised Edition (DC: 0-5™). (2016). Washington, DC, Zero To Three Press,
6. Wills L, Garcia J. Parasomnias: epidemiology and management. *CNS Drugs*. 2002; 16(12): 803-10. Doi:10.2165/00023210-200216120-00002
7. Ohayon MM, Guilleminault C, Priest RG. Night terrors, sleepwalking, and confusional arousals in the general population: their frequency and relationship to other sleep and mental disorders. *Journal of Clinical Psychiatry*. 1999;60(4):268-276.
8. Bjorvatn B, Grønli J, Pallesen S: Prevalence of different parasomnias in the general population. *Sleep Medicine*. 2010, 11(10):1031-4. doi:10.1016/j.sleep.2010.07.011
9. Mason TB II, Pack AI. Sleep terrors in childhood. *The Journal of Pediatrics*. 2005; 147(3): 388-92.
10. Singh S, Kaur H, Singh S, Khawaja I et al. Parasomnias: A comprehensive review. *Cureus*. 2018; 10(12):3807. Doi: 10.7759/cureus.3807
11. Avidan AY, Kaplish N. The parasomnias: epidemiology, clinical features, and diagnostic approach. *Clinics in Chest Medicine*. 2010; 31(2): 353-70. Doi:10.1016/j.ccm.2010.02.015
12. Bhargava S. Diagnosis and management of common sleep problems in children. *Pediatrics in Review*. 2011; 32(3): 91-8. Doi:10.1542/pir.32-3-91
13. Carter KA, Hathaway NE, Lettieri CF. Common sleep disorders in children. *American Family Physician*. 2014; 89(5): 368-77.
14. Guzman CS, Wang YP. Sleep terror disorder: a case report. *Brazilian Journal of Psychiatry*. 2008; 30(2): 169. Doi:10.1590/S1516-44462008000200016
15. Gupta R, Goel D, Kandpal SD, et al. Prevalence of sleep disorders among primary school children. *The Indian Journal of Pediatrics*. 2016; 83(11): 1232-6. <http://dx.doi.org/10.1007/s12098-016-2138-7>
16. Kim DS, Lee CL, Ahn YM. Sleep problems in children and adolescents at pediatric clinics. *Korean Journal of Pediatrics*. 2017; 60(5): 158-65. <http://dx.doi.org/10.3345/kjp.2017.60.5.158>
17. Sodan Turan H, Gündüz N, Polat A, et al. Treatment approach to sleep terror: Two case reports. *Nöro Psikiyatri Arsivi*. 2015; 52(2): 204-6. Doi: 10.4274/npa.y7243
18. Petit D, Pennestri M, Paquet J, et al. Childhood sleepwalking and sleep terrors: a longitudinal study of prevalence and familial aggregation. *JAMA Pediatrics*. 2015; 169(7):653-658. doi:10.1001/jamapediatrics
19. Brockmann PE, Urschitz MS, Schlaud M, et al. Primary snoring in school children: prevalence and neurocognitive impairments. *Sleep and Breathing*. 2012;16(1):23–29. Doi:10.1007/s11325-011-0480-6
20. Van Horn NL, Street M. Night Terrors. Treasure Island, FL: *StatPearls*. 2021. PMID: 29630274.
21. Agargun MY, Cilli AS, Sener S, et al. The prevalence of parasomnias in preadolescent school-aged children: a Turkish sample. *Sleep*. 2004; 27(4): 701-5. <http://dx.doi.org/10.1093/sleep/27.4.701>
22. Crisp AH. The sleepwalking/night terrors syndrome in adults. *Postgraduate Medical Journal*. 1996; 72(852): 599-604. <http://dx.doi.org/10.1136/pgmj.72.852.599>.
23. Dolder CR, Nelson MH. Hypnotic-induced complex behaviours: incidence, mechanisms and management. *CNS Drugs*. 2008;22(12):1021-1036. doi:10.2165/0023210-200822120-00005.



24. Howell MJ. Parasomnias: an updated review. *Neurotherapeutics*. 2012;9(4):753-775. Doi:10.1007/s13311-012-0143-8.
25. Irfan M, Schenck CH, Howell MJ: Non-rapid eye movement sleep and overlap parasomnias. *Continuum (Minneapolis)*. 2017; 23:1035-1050. Doi:10.1212/con.0000000000000503
26. Yılmaz H. Parasomniler. Kaynak H, Ardıç S. (editörler). *Uyku fizyolojisi ve Hastalıkları*. İstanbul, Nobel Kitabevi,2011 p:309-15
27. Kotagal S. Parasomnias in childhood. *Sleep Medicine Reviews*. 2009;13(2):157-68.
28. Benbir G, Karadeniz D, NREM uyku evresi ile ilişkili parasomniler. *Türkiye Klinikleri Journal of Neurology Special Topics*. 2015;8:1:42-8
29. Mason TB, Pack AI. Pediatric parasomnias. *Sleep*. 2007;30(2):141-51.
30. Özgen F. Uyku ve Uyku bozuklukları. *Psikiyatri Dünyası*. 2001;5:41-8.
31. Zadra A, Desautels A, Petit D, et al. Somnambulism: clinical aspects and pathophysiological hypotheses. *The Lancet Neurology*. 2013;12(3):285-294.
32. Zadra A, Pilon M. NREM parasomnias. *Handbook of Clinical Neurology*. 2011;99:851-868.
33. Ekambaram V, Maski K. Non-Rapid Eye Movement Arousal Parasomnias in Children. *Pediatric Annals*. 2017;46(9):327-331.
34. Rosen GM, Mahowald MW. Disorders of arousal in children. In: Sheldon SH, Ferber R, Kryger MH, (eds). *Principles and Practise of Pediatric Sleep Medicine* (293-304). Philadelphia:Elsevier Saunders;2005.
35. Schenck CH, Mahowald MW. Review of nocturnal sleep-related eating disorders. *The International Journal of Eating Disorders*. 1994;15:343-356. Doi: 10.1002/eat.2260150405
36. Winkelman JW. Clinical and polysomnographic features of sleep-related eating disorder. *Journal of Clinical Psychiatry*. 1998;59:14-19.
37. Schenck CH. Paradox lost: midnight in the battleground of sleep and dreams. *Extreme-Nights*, 2006. LLC. p435. doi.org/10.1136/jnnp.2006.096131
38. Schenck CH, Hurwitz TD, Bundlie SR, Mahowald MW. Sleep-related eating disorders: polysomnographic correlates of a heterogeneous syndrome distinct from daytime eating disorders. *Sleep*. 1991; 14(5):419-431. doi:10.1093/sleep/14.5.419.
39. Brion A, Flamand M, Oudiette D, et al. Sleep-related eating disorder versus sleepwalking: a controlled study. *Sleep Medicine*. 2012;13(8):1094-1101. doi:10.1016/j.sleep.2012.06.012.
40. Winkelman JW, Herzog DB, Fava M. The prevalence of sleep-related eating disorder in psychiatric and non-psychiatric populations. *Psychological Medicine*. 1999;29(6):1461-1466. Doi:10.1017/S0033291799008272
41. Inoue Y. Sleep-related eating disorder and its associated conditions. *Psychiatry and Clinical Neuroscience*. 2015;69(6):309-320. doi:10.1111/pcn.12263.
42. Mindell JA, Owens J. Sleepwalking and Sleep Terrors. *A Clinical Guide to Pediatric Sleep*. Philadelphia. Lipincott Williams &Wilkins, 2003
43. Leung AKC, Leung AAM, Wong AHC, et al. Sleep Terrors: An Updated Review. *Current Pediatric Reviews*, 2020,16,176-182. Doi: 10.2174/1573396315666191014152136
44. Kushida CA, Littner MR, Morgenthaler T et al. Practice parameters for the indications for polysomnography and related procedures: an update for 2005. *Sleep* 2005;28(4):499Y521. doi:10.1093/sleep/28.4.499..
45. Kotagal S, Nichols CD, Grigg-Damberger MM, et al. Non-respiratory indications for polysomnography and related procedures in children: an evidence-based review. *Sleep*. 2012;35(11):1451-1466. doi:10.5665/sleep.2188.
46. Leung AK, Robson WL. Nightmares. *Journal of National Medical Association*. 1993;85(3): 233-5.
47. Silber MH. Parasomnias occurring in non-rapid eye movement sleep. *Continuum*. 2020;26(4):946-962. doi: 10.1212/CON.0000000000000877.
48. Bruni O, Ferri R, Novelli L, et al. NREM sleep instability in children with sleep terrors: the role of slow-wave activity interruptions. *Clinical Neurophysiology*. 2008;119(5):985-992. Doi:10.1016/j.clinph.2008.01.015



49. Licit A. Sleep-wake disorders in childhood. *Continuum*. 2020; 26(4):1034-1069. doi: 10.1212/CON.0000000000000897
50. Guilleminault C, Palombini L, Pelayo R, et al. Sleepwalking and sleep terrors in prepubertal children: what triggers them? *Pediatrics*. 2003;111(1):e17-e25. DOI: <https://doi.org/10.1542/peds.111.1.e17>
51. Derry C. Nocturnal frontal lobe epilepsy vs parasomnias. *Current Treatment Options in Neurology*. 2012; 14(5): 451-463. doi:10.1007/s11940-012-0191-8
52. Lombroso CT. Pavor nocturnus of proven epileptic origin. *Epilepsia*. 2000; 41(9): 1221-6. Doi:10.1111/j.1528-1157.2000.tb00329.x
53. Craske MG, Tsao JC. Assessment and treatment of nocturnal panic attacks. *Sleep Medicine Reviews*. 2005;9(3):173-184. doi:10.1016/j.smrv.2004.11.003
54. Leung AK, Hon KL. Gastroesophageal reflux in children: an updated review. *Drugs in Context*. 2019;8:212591. doi: 10.7573/dic.212591
55. Arnulf I, Zeitzer JM, File J et al. Kleine-Levin syndrome: a systematic review of 186 cases in the literature. *Brain*. 2005;128(12):2763-2776. doi:10.1093/brain/awh620
56. Petit D, Touchette E, Tremblay RE, et al. Dysomnias and parasomnias in early childhood. *Pediatrics*. 2007;119:e1016-25. DOI: 10.1542/peds.2006-2132
57. Arnulf I, Ugucioni G, Gay F, et al. What does the sleeping brain say? Syntax and semantics of sleep talking in healthy subjects and in parasomnia patients. *Sleep*. 2017;40(11). <https://doi.org/10.1093/sleep/zsx159>.
58. Espa F, Dauvilliers Y, Ondze B, et al. Arousal reactions in sleepwalking and night terrors in adults: the role of respiratory events. *Sleep*. 2002;25(8):871-875.
59. Gau SF, Soong WT. Psychiatric comorbidity of adolescents with sleep terrors or sleepwalking: a case-control study. *Australian and New Zealand Journal of Psychiatry*. 1999;33(5):734-739. DOI: 10.1080/j.1440-1614.1999.00610.x
60. Smedje H, Broman J.E., Hetta J. Associations between disturbed sleep and behavioural difficulties in 635 children aged six to eight years: a study based on parents' perceptions. *European Child and Adolescent Psychiatry*. 2001;10(1):1-9. doi:10.1007/s007870170041
61. Hochadel J, Frölich J, Wiater A. et al. Prevalence of sleep problems and relationship between sleep problems and school refusal behavior in school-aged children in children's and parents' ratings. *Psychopathology*. 2014;47(2):119-126. doi:10.1159/000345403
62. Schenck CH, Milner DM, Hurwitz TD, et al. A polysomnographic and clinical report on sleep-related injury in 100 adult patients. *American Journal of Psychiatry*. 1989;146(9):1166-1173.
63. Szelenberger W, Niemcewicz S, Dabrowska AJ. Sleepwalking and night terrors: psychopathological and psychophysiological correlates. *International Review of Psychiatry*. 2005;17(4):263-270.
64. Ahmed IM, Thorpy MJ. Clinical evaluation of parasomnias. In: Thorpy M, Plazzi G, (eds). *The Parasomnias and Other Sleep-Related Movement Disorders*. Cambridge, UK: Cambridge University Press; 2010:19-33.
65. Nevsimalova S, Prihodova I, Kemlink D, et al. Childhood parasomnia—a disorder of sleep maturation? *European Journal of Paediatric Neurology*. 2013;17(6):615-619. Doi: 10.1016/j.ejpn.2013.05.004
66. Lopez R, Jaussent I, Scholz S, et al. Functional impairment in adult sleepwalkers: a case-control study. *Sleep*. 2013;36(3):345-351.
67. Horvath A, Papp A, Szucs A. Progress in elucidating the pathophysiological basis of nonrapid eye movement parasomnias: not yet informing therapeutic strategies. *Nature and Science of Sleep*. 2016;8:73-79. doi:10.2147/NSS.S71513.
68. Heidbreder A, Frauscher B, Mitterling T, et al. Not only sleepwalking but NREM parasomnia irrespective of the type is associated with HLA DQB1*05:01. *Journal of Clinical Sleep Medicine*. 2016;12(4):565-570. doi:10.5664/jcsm.5692
69. Lecendreux M, Bassetti C, Dauvilliers Y, et al. HLA and genetic susceptibility to sleepwalking. *Molecular Psychiatry* (2003) 8, 114-117. doi:10.1038/sj.mp.4001203
70. Kales A, Soldatos CR, Bixler EO, et al. Hereditary factors in sleepwalking and night terrors. *The British Journal of Psychiatry*. 1980;137:111-118.



71. Licis AK, Desruisseau D, Yamada KA, et al. Novel genetic findings in an extended family pedigree with sleepwalking. *Neurology* 2011;76(1):49-52. doi:10.1212/WNL.0b013e318203e964.
72. Nguyen BH, Pérusse D, Paquet J, et al. Sleep terrors in children: a prospective study of twins. *Pediatrics*. 2008;122(6):e1164-e1167.
73. Adrien J. The serotonergic system and sleep-wakefulness regulation. In: Kales A (ed). *The Pharmacology of Sleep*. 1995:p.91-116. Berlin/Heidelberg/ New York: Springer.
74. Jacos BL, Azmitia EC. Structure and function of the brain serotonin system. *Physiological Reviews*. 1992;72(1):165-229.
75. Bruni O, Ferri R, Miano S, et al. L-5-Hydroxytryptophan treatment of sleep terrors in children. *European Journal of Pediatrics*. 2004;163(7): 402-407. Doi: 10.1007/s00431-004-1444-7
76. Van Zyl LT, Chung SA, Shahid A, et al. L-Tryptophan as treatment for pediatric non-rapid eye movement parasomnia. *Journal of child and adolescent psychopharmacology*. 2018;28(6):395-401.
77. Juszczak GR, Swiergiel AH. Serotonergic hypothesis of sleepwalking. *Medical Hypotheses*. 2005;64(1):28-32. Doi:10.1016/j.mehy.2004.06.013
78. Barabas G, Ferrari M, Matthews WS. Childhood migraine and somnambulism. *Neurology*. 1983;33 (7):948-949. Doi: 10.1212/wnl.33.7.948
79. Messina A., Bitetti L., Precenzano F., et al. Non-Rapid Eye Movement Sleep Parasomnias and Migraine: A Role of Orexinergic Projections. *Frontiers in Neurology*. 2018;9:95. doi:10.3389/fneur.2018.00095
80. Di Gennaro G, Autret A, Mascia A, et al. Night terrors associated with thalamic lesion. *Clinical Neurophysiology*. 2004;115(11):2489-2492. Doi: 10.1016/j.clinph.2004.05.029
81. Steriade M, Llinás RR. The functional states of the thalamus and the associated neuronal interplay. *Physiological Reviews*. 1988;68(3):649- 742. doi:10.1152/physrev.1988.68.3.649
82. Neckelmann D, Ursin R. Sleep stages and EEG power spectrum in relation to acoustical stimulus arousal threshold in the rat. *Sleep*. 1993;16(5):467-477. Doi: 10.1093/sleep/16.5.467
83. Parrino L, Halasz P, Tassinari CA, et al. CAP, epilepsy and motor events during sleep: the unifying role of arousal. *Sleep Medicine Reviews*. 2006;10(4):267-285. doi:10.1016/j.smrv. 2005.12.004
84. Rodriguez CL, Foldvary-Schaefer N. Clinical neurophysiology of NREM parasomnias. *Handbook of Clinical Neurology*, 2019;161:397-410.
85. Castelnovo A, Lopez R, Proserpio P, et al. NREM sleep parasomnias as disorders of sleep-state dissociation. *Nature Reviews Neurology*. 2018;14(8):470-481. Doi: 10.1038/s41582-018-0030-y
86. Guilleminault C, Kirisoglu C, Da Rosa AC, et al. Sleepwalking, a disorder of NREM sleep instability. *Sleep Medicine*. 2006;7(2):163-170. Doi:10.1016/j.sleep.2005.12.006
87. Stallman HM, Kohler M, White J. Medication induced sleepwalking: A systematic review. *Sleep Medicine Reviews* 2018;37, February 2018, 105-113. doi:10.1016/j.smrv.2017.01.005
88. Thiedke CC. Sleep disorders and sleep problems in childhood. *American Family Physician* 2001; 63(2): 277-284. PMID: 11201693
89. Baroni A, Anders T.F. Sleep Disorders. In: Andrés Martin (ed). *Lewis's Child and Adolescent Psychiatry A Comprehensive Textbook*. 5th ed. Philadelphia: Wolters Kluwer, 2018. p.580-590.
90. Simon SL, Byars KC. Behavioral treatments for non-rapid eye movement parasomnias in children. *Current Sleep Medicine Reports*. 2016;2: 152-157. Doi: 10.1007/s40675-016-0049-9
91. Lask B. Sleep disorders: "working treatment" best for night terrors. *British Medical Journal*. 1993;306:1477. Doi: 10.1136/bmj.306.6890.1477
92. Byars KC, Simon SL. American Academy of Pediatrics 2016 Safe Sleep Practices: Implications for Pediatric Behavioral Sleep Medicine. *Behavioral sleep medicine*. 2017;15(3):175-179. doi:10.1080/15402002.2017.1292726
93. Roehrs T, Roth T. Drug-related sleep stage changes: functional significance and clinical relevance. *Sleep Medicine Clinics*. 2010;5(4):559-570.
94. Jan JE, Freeman RD, Wasdell MB, et al. 'A child with severe night terrors and sleep-walking responds to melatonin therapy'. *Developmental Medicine & Child Neurology*. 2004; 46(11): 789. Doi:10.1111/j.1469-8749.2004.tb01003.x PMID: 15540644



95. Ozcan O, Dönmez YE. Melatonin treatment for childhood sleep terror. *Journal of child and adolescent psychopharmacology*. 2014; 24(9): 528-9. Doi:10.1089/cap.2014.0061 PMID: 25264873
96. Popoviciu L, Corfariu O. Efficacy and safety of midazolam in treatment of night terrors in children. *British Journal of Clinical Pharmacology*. 1983;16: 97S-102S. Doi: 10.1111/j.1365-2125.1983.tb02278.x
97. Frölich J, Wiater A., Lehmkuhl G. Successful treatment of severe parasomnias with paroxetine in a 12-year-old boy. *International Journal of Psychiatry in Clinical Practice*. 2001;5(3):215-218. Doi: 10.1080/136515001317021707
98. Hoşoğlu E, Hergüner S. Childhood sleep terror and mirtazapine. *Journal of child and adolescent psychopharmacology*. 2016;26(6):568. doi: 10.1089/cap.2016.0071
99. Sasayama D, Washizuka S, Honda H. Effective treatment of night terrors and sleepwalking with Ramelteon. *Journal of child and adolescent psychopharmacology*. 2016;26:948.
100. Mallhotra RK, Avidan AY. Parasomnias and their mimics. *Neurologic Clinics*. 2012;30:1067-1094 doi: 10.1016/j.ncl.2012.08.016
101. Becker SP, Gregory AM. Editorial perspective: Perils and promise for child and adolescent sleep and associated psychopathology during the COVID-19 pandemic. *The Journal of Child Psychology and Psychiatry*. 2020;61(7):757-759. doi: 10.1111/jcpp.13278.
102. Xu H, Wen LM, Hardy LL, et al. Associations of outdoor play and screen time with nocturnal sleep duration and pattern among young children. *Acta Paediatrica*. 2016;105(3):297-303. doi: 10.1111/apa.13285.
103. Luo J, Cao M, Sun F, et al. Association between outdoor activity and insufficient sleep in Chinese school-aged children. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*. 2020;26. doi:10.12659/MSM.921617.
104. Cheung CHM, Bedford R, Saez De Urabain IR, et al. Daily touchscreen use in infants and toddlers is associated with reduced sleep and delayed sleep onset. *Scientific Reports*. 2017;7(1):46104. doi: 10.1038/srep46104.
105. Lissak G. Adverse physiological and psychological effects of screen time on children and adolescents: literature review and case study. *Environmental Research*. 2018;164:149-157. doi: 10.1016/j.envres.2018.01.015.
106. Higuchi S, Motohashi Y, Liu Y, et al. Effects of playing a computer game using a bright display on presleep physiological variables, sleep latency, slow wave sleep and REM sleep. *Journal of Sleep Research*. 2005;14(3):267-273. doi: 10.1111/j.1365-2869.2005.00463.x.
107. Lecuelle F, Leslie W, Huguélet S, et al. Did the COVID-19 lockdown really have no impact on young children's sleep? *Journal of Clinical Sleep Medicine*. 2020;16(12):2121. doi: 10.5664/jcs.m.8806.
108. Dellagiulia A, Lionetti F, Fasolo M, et al. Early impact of COVID-19 lockdown on children's sleep: a 4-week longitudinal study. *Journal of Clinical Sleep Medicine*. 2020;16(9):1639-1640. doi: 10.5664/jcs.m.8648.
109. Liu Z, Tang H, Jin Q, et al. Sleep of preschoolers during the coronavirus disease 2019 (COVID-19) outbreak. *Journal of Sleep Research*. July 2020;30 (3);e13142. doi:10.1111/jsr.13142.
110. Di Giorgio E, Di Riso D, Mioni G, et al. The interplay between mothers' and children behavioral and psychological factors during COVID-19: an Italian study. *European Child and Adolescent Psychiatry*. 2020. doi:10.1007/s00787-020-01631-3.
111. Moore SA, Faulkner G, Rhodes RE, et al. Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: a national survey. *International Journal of Behavioral Nutrition and Physical Activity*. 2020;17(1):85. doi: 10.1186/s12966-020-00987-8.
112. Dondi A., Fetta A., Lenzi J. Sleep disorders reveal distress among children and adolescents during the Covid-19 first wave: results of a large web-based Italian survey. *Italian Journal of Pediatrics*. 2021;47, Article number:130.