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LETTERS TO THE EDITOR

Early impact of COVID-19 lockdown on children's sleep: a 4-week longitudinal study

Antonio Dellagiulia, PhD[1,*]; Francesca Lionetti, PhD[2,3,*]; Mirco Fasolo, PhD[2]; Chiara Verderame, MSc[1]; Alessandra Sperati, MSc[1]; Guido Alessandri, PhD[4]

*[1]Department of Psychology, Salesian University of Rome, Rome, Italy; [2]Department of Neurosciences, Imaging and Clinical Sciences, University "G. D'Annunzio", Chieti-Pescara, Italy; [3]Department of Biological and Experimental Psychology, Queen Mary University of London, London, United Kingdom; [4]Department of Psychology, Sapienza University of Rome, Rome, Italy; *Shared first authorship*

INTRODUCTION

Italy has been one of the most affected country by COVID-19, with the first case reported February 21. To decrease the risk of contagious, the government adopted a series of public actions: March 4, childcare services, schools, and universities closed, and from March 11, the entire country experienced the lockdown.

These measures required that children have a significant separation from social systems and a redefinition of daily habits within the family.[1] Thus, the lockdown could also represent a major burden for psychological well-being, increasing the risk of mental health problems.[2]

To understand the impact of COVID-19 on mental health, the number of studies has rapidly increased, but those focusing on children are still scarce.[3] With this study, we investigated the impact of lockdown on children's sleep quality, because poor sleep is a contributing factor to the development of psychopathology in children in the long run.[4] Specifically, we explored inter- and intraindividual daily variation of preschooler's sleep duration and quality across the first 4 weeks of the emergency in Italy.

METHODS

For 30 consecutive days, from February 25 to March 25, 37 mothers of preschool children in central Italy received a questionnaire investigating sleep duration, sleep quality, and bedtime routine twice a day (9:45 PM and 9:30 AM) on their mobile device. The response rate was 82% of total responses. The study was approved by Ethical Committee of Salesian University of Rome (CSF503). No compensation was offered for participation, and data were collected anonymously.

To obtain the total night sleep duration, information on time of falling asleep and waking up was collected. The mother's perception of their child's appearance in the morning (How does your child appear this morning? Tired/Rested) and quality of bedtime routine (How would you rate your child bedtime this evening? Problematic/Ideal) were considered indicators of sleep quality and sleep habits and rated on a visual analog scale ranging from 0 to 100, with higher scores reflecting higher sleep quality and ideal bedtime routine.

Changes in sleep patterns were investigated using multilevel latent growth modeling[5] by comparing four models. The first assumed no change in sleep patterns during the investigated period; the second model assumed a linear change; the third estimated a quadratic change; and in the fourth model, we piecewise segmented the latent growth trajectory in a pre-lockdown phase (from the beginning of the study to March 11) and a full lockdown phase.

RESULTS

Mothers' mean age was 38.94 years (SD = 4.58; range, 29–49 years), and for children it was 3.81 years (SD = 0.74; range, 3–6 years; 48.65% female). None were affected by COVID-19.

For sleep duration, results supported a quadratic pattern, with a decrease and then a stabilization of this pattern of decrease. For bedtime routine and sleep quality, results supported a piecewise growth curve model, with a linear and decreasing pattern from the first day of the study until March 11 (**Table 1**). Afterward, despite some significant between-individual variability, the pattern became stable, and no more changes occurred.

DISCUSSION

The Consensus Statement of the American Academy of Sleep Medicine defines healthy sleep as the resultant of adequate duration, appropriate timing, regularity, good quality, and absence of disturbance or disorder.[6] Results suggest that a critical period for children's optimal sleep was represented by the initial phase of the pandemic. Since the first cases were registered and childcares closed, parents reported more challenging bedtime routines, and children's sleep quality decreased. After the initial phase, there was a stabilization of routine and of the quality of sleep, which, however, remained overall of a poorer quality compared with the initial days,

Table 1—Model fit and estimated model parameters.

Name of the Fixed Parameter	Fixed Effects			Name of the Random Parameter	Random Effects			AIC		
	β	LL	UL		Intercept	Change 1	Change 2	ICC	Estimates	
Bedtime routine									No growth	9,943.33
Intercept	63.65	59.76	67.55	Intercept	146.76			0.33	Linear	9,941.68
Change 1	−0.31	−0.55	−0.06	Change 1	NS	NS			Quadratic	9,941.99
Change 2	0.1	−0.43	0.63	Change 2	0.26	NS	2.04		Piecewise	9,870.66
Sleep quantity									No growth	4,577.82
Intercept	11.04	10.85	11.22	Intercept	0.5			0.08	Linear	4,516.15
Linear	0.11	0.06	0.16	Linear	0.55	0.01			Quadratic	4,512.9
Quadratic	0.01	0.00	−2.69e−4	Quadratic	NS	NS	NS		Piecewise	4,516.11
Sleep quality									No growth	9,539.79
Intercept	65.18	62.57	67.8	Intercept	62.92			0.24	Linear	9,472.02
Change 1	0.41	0.03	0.79	Change 1	0.4	0.3			Quadratic	9,458.58
Change 2	−0.02	−0.32	0.27	Change 2	0.1	0.29	1.06		Piecewise	9,457.28

β = regression coefficient, LL = lower limit, UL = upper limit, ICC = intraclass correlation coefficient, AIC = akaike information criterion, NS = nonsignificant.

whereas the amount of sleep time decreased and then stabilized. Hence, these results suggest that COVID-19 had an early impact on sleep quality in children and that interventions to promote family well-being should be scheduled from the very beginning of the emergency period if a pandemic returns.

The World Health Organization recommendation[7] for helping children to cope with COVID-19 suggests to maintain a regular routine or create new positive ones. The spread of information on how to maintain positive sleep habits and a regular routine among parents could be particularly important during the first weeks of a pandemic lockdown.

CITATION

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Address correspondence to: Antonio Dellagiulia, PhD, Department of Psychology, Salesian University of Rome, P.zza Ateneo Salesiano, 1, 00139 Rome, Italy; Tel: +39 3394262828; Email: dellagiulia@unisal.it

DISCLOSURE STATEMENT

All authors have seen and approved the manuscript. Work for this study was performed at Salesian University of Rome. The authors report no conflicts of interest.