Supplement 1: Characteristics of identified research

First author (year), country	Research methodology and method/type of research	Purpose/objectives of the research	Survey sample (*n*)	Main results of the research	Strength /level of evidence
Berger et al. (2021), USA	Contemporary review	To present an examination of what is known about sleep in hospitalized children, mainly in the neonatal and paediatric intensive care units (NICU/PICU), and to describe the risk factors, mainly in adolescents.	*n* = this review does not specify the survey sample size	Optimizing sleep for hospitalized children is challenging, but very important for research. Even if the disease may lead to sleep disturbances, reducing environmental and hospital factors based on long-standing medical practice and culture, could reduce the harmful effects. Positive results of existing and future trials could create great potential for the implementation of non-pharmacological care bundles, to optimize the sleep in acutely ill children during critical neurodevelopment periods.	Level 7
Burger et al. (2024), Netherlands	Quantitative methodology, prospective observational study	To identify factors, which most influence sleep during the hospitalization (environment, disease, staff, patient, and treatment-related) and to investigate the prevalence of sleep disturbances. The secondary objectives focus on comparing sleep at home versus in the hospital and to examine the sleep evolution during the hospitalization.	*n* = 272 children, aged 1 to 12 years	Sleep in the hospital was mainly disrupted because of the treatment, environment, and staff related factors. Parents reported their children had worse sleep quality, lower satisfaction, and more sleep problems in the hospital setting compared to at home. The results show the factors that affect sleep during hospitalization, and the need for accessible interventions aimed at improving sleep quality and reducing sleep disturbances.	Level 5

Cook et al. (2020), USA	Quantitative methodology, prospective observational study	To find out how reducing unnecessary overnight BP monitoring can improve sleep in hospitalized children.	*n* = 458 children in the pre-intervention period and 493 records of BP measurement orders in children aged 30 days to 18 years) *n* = 1214 patients and 1472 records of BP measurements in the post-intervention period (children aged 30 days to 18 years)	A statistically significant increase in sleep duration by 82.4 minutes was reported in children aged >24 months after reducing unnecessary overnight BP monitoring at night. Unfortunately, no statistically significant change in sleep length was observed in children aged < 24 months. A 25% reduction in night awakenings was also reported in children older than 24 months, although this difference was not statistically significant.	Level 5
Crevits et al. (2024), France	Quantitative methodology, retrospective preliminary study	To evaluate the efficacy of cognitive and behavioural therapy for insomnia (CBT-I) on sleep disturbances in adolescents with anorexia nervosa (AN), for the first time.	*n* = 31 adolescents in the CBT-I group *n* = 11 adolescents in the control group, in-treatment at the pediatric unit for children with eating disorders	Children undergoing CBT-I showed an important improvement in sleep latency, total wake time, sleep efficacy, and physical wellbeing. No major effects were found about anorexia nervosa symptoms.	Level 5
Hybschmann et al. (2021), Denmark	A scoping review	To map the research on sleep in children and adolescents (including various aspects of sleep, e.g., duration and awakenings) during hospitalization, and to identify factors that affect sleep in this group.	*n* = 28 studies included in the review *n* = from 9 to 394 participants, from 1.9 to 15.7 years of age	Hospitalized paediatric patients experience shorter sleep because they are exposed to various external and internal factors. Some can be limited with sleep promoting interventions, as sleep plays an important role for the health, recovery, and wellbeing of this patient group. The available data highlights the need for future studies that can address the challenges of the current literature.	Level 6
Kudchadkar et al. (2022), USA	Systematic review of non-experimental studies	To assess the effect of non-pharmacological interventions to promote sleep in hospitalized children and adolescents on sleep quality	*n* = 528 children aged 3 to 22 years, in hospital paediatric settings (10 studies)	Touch therapy can improve total sleep time and sleep quality in children with burns. Massage and bedtime stories may also improve sleep, but the results are not completely reliable due to differences in population and measurement	Level 4

		and duration, child or parent satisfaction, cost-effectiveness, incidence of delirium, length of mechanical ventilation, length of stay and mortality.		methods. Children and parents are satisfied with both massage and relaxation techniques to improve sleep. The results are less reliable because the people in the study knew which sleep-enhancing method they received. No studies reported on the length of ventilator support, delirium, cost-effectiveness, length of hospital stay, or mortality. One study found that using an exercise bike to improve sleep may not improve total sleep time or sleep quality compared to usual care. Another study looked at whether organized play improves sleep; this found inconsistent results for boys and girls, and for children in different age groups. No studies assessed child or parent satisfaction, cost-effectiveness, delirium, length of ventilator support, length of hospital stay, or mortality.	
Lechosa-Muñiz et al. (2024), Spain	Quantitative methodology, cross-sectional study	To examine the sleep patterns of hospitalized children and the changes in sleep patterns after an educational intervention and the implementation of evidence-based practices, aimed at improving the sleep pattern in relation to the duration of sleep and awakenings.	*n* = 100 baseline and 100 post-intervention patients, aged 2–16 years	Up to 4% of the baseline sample and 3% of the six-month sample were prescribed a sleep-promoting medication. Regarding awakenings, 79% of the children in the baseline sample awakened, with a mean of 1.98 awakenings (range 1–13). At six months, the percentage of children who awakened decreased by 17%, with a mean of 1.34 (range 1–5). In the baseline sample, 48% were caused by nursing, decreasing to 34% after the intervention. An educational intervention with the implementation of targeted evidence-based practices is useful for improving the sleep pattern by decreasing the number of awakenings.	Level 5

Namjoo et al. (2021), Iran	Quantitative methodology randomized controlled trial	To compare the effect of recorded lullabies and live maternal lullabies on the physiological responses and sleep duration of premature infants.	*n* = 90 premature infants, divided into 3 groups (2 intervention, 1 control)	The average results of physiological parameters (SpO_2 and heart rate) did not differ significantly in the three groups before, during, and after the intervention ($p > 0.05$). However, there was an improvement in SpO2 and a reduction in heart rate in the two intervention groups. The average duration of night sleep did not differ significantly between the groups before the intervention ($p > 0.05$). There was a statistically significant difference in the intervention groups after the intervention ($p < 0.05$), as the premature infants' night sleep was longer in the group with the recorded lullaby than in the other two groups.	Level 2
Park (2020), USA	Systematic review of non-experimental studies	To research the importance of sleep-in preterm infants, describe tools commonly used to assess infant sleep and identify different sleep–wake states, and identify interventions that promote sleep in preterm infants in the NICU.	*n* = this review does not specify the survey sample size	Preterm infants in the NICU are exposed to harmful disturbances, which shorten their sleep periods. Increasing evidence shows that sleep quality is crucial for the development of the central nervous system and long-term neurodevelopment. That is why it is important to investigate interventions to promote sleep in preterm infants in the NICU, and include them in practice. In studies, researchers reported that interventions including skin-to-skin contact, massage therapy, and cycled light improved sleep-in infants in the NICU. Nurses also play a strong role, incorporating these interventions into neonatal care.	Level 4
Rogers et al. (2019), USA	Quantitative methodology, randomized controlled trial	To determine whether a sleep intervention compared to standard care (SOC) was successful in maintaining nighttime sleep in children	*n* = 33 children (aged 4 to 12) and adolescents (aged 13 to 19)	The mean age was 9.5 ± 3.9 years. 81.8% were white and 60.6% were male. All children's sleep was seriously disturbed throughout the study. Children in the intervention group maintained their longest night's sleep throughout the study,	Level 2

		with CNS cancer who were hospitalized for high-dose chemotherapy (HDCT) and autologous stem cell salvage, and to investigate associations between sleep and fatigue during treatment.		while sleep decreased in children receiving SOC (p = 0.009 for interaction). There were few other differences in sleep between the groups. Adjusting for age and baseline fatigue, a higher nocturnal activity score, and lower sleep percentage were significantly associated with higher youth-reported next-day fatigue (p < 0.05). Longest sleep was significantly positively associated with child-reported tiredness the next day (p = 0.018).	
Topsakal and Ekici (2022), Turkey	Quantitative methodology randomized controlled trial	To evaluate the effect of an illuminated musical mobile on the sleep quality of children hospitalized in a paediatric emergency room.	n = 124 children (aged 12 to 36 months), divided into two equal groups n = 62 children (intervention group) used an illuminated musical mobile n = 62 children (control group) continued with their usual sleep routine	The average age of the children was 1.86 ± 0.78 years. On the day of the intervention, the duration of night sleep was longer in the intervention group (p < 0.0001). The frequency of spontaneous awakenings (p < 0.0001), the time to fall asleep after spontaneous awakenings (p < 0.0001), and problems with sleep time (p < 0.0001) were also lower in the intervention group.	Level 2
Van der Perk et al. (2024), Netherlands	Qualitative methodology, semi-structured interviews	To investigate the parents' reports on quality of sleep, disrupters and promoters of sleep, and the role of health care professionals in creating a healthy sleep environment for children aged 1 to 12 years during hospitalization.	n = parents and their hospitalized children, aged 1 to 12 years (11 interviews)	Compared to at home, parents reported poorer sleep for their children during hospitalization. This shows the importance of interventions for improving the sleep quality of children. The parents also provided valuable suggestions for improvements.	Level 7

Legend: AN – Anorexia nervosa; BP – blood pressure; CBT-I – Cognitive and behavioural therapy for insomnia; HDCT – High-dose chemotherapy; NICU – Neonatal Intensive Care Unit; PICU – Pediatric Intensive Care Unit; SOC – standard care; SpO_2 – Peripheral capillary oxygen saturation