

THE CONTRIBUTIONS OF CHILD TEMPERAMENT, PARENTING
STRESS, AND BEDTIME ROUTINES TO CHILDREN'S SLEEP
BEHAVIORS DURING THE COVID-19 PANDEMIC

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ÖZGE BARATA

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To the ones who were always there for me

ABSTRACT

The current study examined the direct and indirect contributions of children's temperament (reactivity, persistence, and rhythmicity), parenting stress, and bedtime routines to Turkish children's sleep behaviors during the COVID-19 pandemic. Furthermore, this study also examined the moderating role of parenting stress between children's temperament and bedtime routines. The sample was 313 mothers of children between 16 and 84 months ($M = 52.42$, $SD = 12.36$). Mothers reported their children's sleep behaviors, children's bedtime routines, parenting stress, and children's temperament. Multivariate path analyses were run to test the direct, indirect, and moderating effects. Results indicated that parenting stress was negatively related to children's sleep behaviors. Further, it was found that consistency of bedtime routine environments was positively associated with children's sleep behaviors. For the indirect associations, children's temperament (rhythmicity and reactivity) was indirectly associated with children's sleep behaviors via consistency of bedtime routines. For moderating effects, parenting stress moderated the association between persistence and consistency of bedtime routine behaviors. In detail, persistence served as a protector factor for the consistent bedtime routine behaviors in the existence of parenting stress. Findings underline the importance of child temperament, parenting stress, and bedtime routines for children's sleep behaviors. The implications of the findings are discussed in the light of previous research and the bioecological model of human development (Bronfenbrenner & Morris, 2007) in considering their functioning during the COVID-19 pandemic.

Keywords: children's sleep behaviors, temperament, parenting stress, bedtime routines

ÖZET

Mevcut çalışma, çocukların mizacının (tepkisellik, sebatkârlık ve ritmiklik), ebeveynlik stresinin ve yatma zamanı rutinlerinin COVID-19 salgını sırasında Türk çocuklarının uyku davranışlarına doğrudan ve dolaylı katkılarını incelemiştir. Bunun yanında, bu çalışma ebeveynlik stresinin çocukların mizaçları ve yatma zamanı rutinleri arasındaki düzenleyici rolünü de incelemiştir. Örneklem, 16 ila 84 ay arasında çocuğu olan 313 anneden oluşmuştur (*Ort.* = 52.42, *SS*= 12.36). Anneler, çocuklarının uyku davranışlarını, çocukların uyku rutinlerini, ebeveynlik stresini ve çocukların mizacını değerlendirmişlerdir. Doğrudan, dolaylı ve etkileşimsel etkileri test etmek için çok değişkenli yol analizleri yapılmıştır. Sonuçlar, ebeveynlik stresinin çocukların uyku davranışlarıyla olumsuz ilişkili olduğunu göstermiştir. Ayrıca, yatma zamanı rutin ortamlarının tutarlılığının, çocukların uyku davranışları ile pozitif olarak ilişkili olduğu bulunmuştur. Dolaylı ilişkilerde, çocukların mizacının (ritmiklik ve tepkisellik), yatma zamanı rutinlerinin tutarlılığı yoluyla çocukların uyku davranışlarıyla dolaylı olarak ilişkili olduğu görülmüştür. Denetleyici etkilerde, ebeveynlik stresinin yatmadan önce rutin davranışların tutarlılığı ve sebatkârlık arasındaki ilişkiyi denetlediği görülmüştür. Detaylı olarak, sebatkârlık, ebeveynlik stresinin varlığında tutarlı yatma zamanı rutin davranışları için bir koruyucu faktör olarak hizmet etmiştir. Bulgular, çocukların uyku davranışları için çocuk mizacının, ebeveynlik stresinin ve yatma zamanı rutinlerinin önemini vurgulamaktadır. Sonuçlar önceki araştırmaların ve insan gelişiminin Biyoekolojik m-Modelinin (Bronfenbrenner & Morris, 2007) ışığında, COVID-19 salgını sırasındaki işlevleri göz önünde bulundurularak tartışılmıştır.

Anahtar Kelimeler: çocukların uyku davranışları, mizaç, ebeveynlik stresi, yatma zamanı rutinleri

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CHAPTER 1

INTRODUCTION

Children during preschool years generally spend more time sleeping than any particular daily activity like social interaction, exploring, learning, or eating (Dahl, 1996; Matricciani et al., 2013). The quality of sleep, therefore, becomes very important for their physical, social, and cognitive development directly (National Sleep Foundation, 2020). Despite the importance of sleep for children's development, according to the American Academy of Pediatrics (AAP), a quarter of children under the age of five, experience sleep problems (Bathory & Tomopoulos, 2017). These problems include inadequate sleep duration, sleep anxiety, bedtime resistance, sleep onset delay, night waking, daytime sleepiness, parasomnias, sleep-disordered breathing (Owens et al., 2000).

Considering children develop through bidirectional interactions with their environments (Bronfenbrenner & Morris, 2006), biological factors such as temperament, psychological factors (e.g., parenting stress), and socio-contextual factors like home environment, daily routines, or parenting characteristics influence the emergence of sleep problems (Breitenstein et al., 2021). Child temperament characteristics are associated with different sleep behaviors (Scher et al., 1992). For example, when children's temperamental reactivity was high, they experienced greater sleep problems such as nighttime wakings, lower sleep duration, or sleep onset delays (Molfese et al., 2015). Moreover, as in early childhood children's sleep routines are mainly organized by parents or other caregivers rather than children themselves, parenting stress could be an undermining factor for children's sleep

behaviors and problems (Hoyniak et al., 2018). Additionally, bedtime routines are important for children's sleep behaviors, particularly for children with certain temperamental characteristics such as reactivity (Henderson & Jordan, 2009). In general, consistent and positive bedtime routines are associated with greater sleep quality in children (Mindell et al., 2015). However, children with difficult temperamental characteristics that are prone to have sleep problems may be more affected by parenting stress, and their bedtime routines may be interrupted due to their tendency to easily get disturbed (Wilson et al., 2014).

Considering the importance of healthy interactions for child development, from the intra-individual level to inter-individual interactions, during the COVID-19 pandemic, these daily social interactions of children have been substantially changed (Bates et al., 2020). The restrictions of the pandemic circumstances caused a lack of physical activity, higher parenting stress, lack of interaction with peers, reduced outdoor time, online education, and increased screen time (Altena et al., 2020; Bates et al., 2020; Becker & Gregory, 2020; Wang et al., 2020). As interactions hold an important role in child development, studies have been trying to understand the impact of the changes in the pandemic period on children's sleep behaviors (Altena et al., 2020; Bates et al., 2020; Dellagiulia et al.; Liu et al., 2020; Wang et al., 2020; Zreik et al., 2020). Consequently, the changes in daily routines during COVID-19 have influenced children's sleep time, routine, and sleep quality (Bates et al., 2020; Becker & Gregory, 2020; Dellagiulia et al., 2020; Zreik et al., 2020). Living in novel and unpredictable conditions have increased both children's and parents' stress levels and anxiety, thus have negative influences on their sleep

quality (Altena et al., 2020; Liu et al., 2020, Zreik et al., 2020). Additionally, the social restrictions and home-schooling have caused to increase in blue light exposure on digital media, decreased physical activity level, increased food consumption, and diminished exposure to daylight, all of which have significant negative influences on sleep behaviors (Altena et al., 2020; Becker & Gregory, 2020). Parents reported higher parenting stress (Brown et al., 2020) and decreased sleep duration and quality for their children during the COVID-19 pandemic (Zreik et al., 2020). From the beginning of school closures, children have experienced more difficulty in maintaining bedtime routines, and consequently, their sleep quality has decreased (Bates et al, 2020; Dellagiulia et al., 2020). They had unscheduled sleep, no set wake time or bedtime, late sleep time, and difficulties to falling asleep or staying asleep (Bates et al., 2020; Liu et al., 2020). Even though the stabilization of routine was managed after the initial phase of the pandemic, the sleep time and quality remained poorer compared with the pre-pandemic period (Dellagiulia et al., 2020). Although there has been no research on how children adapt to pandemic circumstances depending on their temperament, it is known that children with high reactivity could be more sensitive to stressful environments and may experience developmental problems (Rothbart & Bates, 2007). Subsequently, it could be predicted that children with high in reactivity may have more difficulty in adapting to environmental changes and may experience more problems with sleep. Furthermore, due to the expanded roles in managing the household, work, and childcare, parenting stress levels is increased and parents experience difficulties maintaining consistent sleep behaviors for their children (Brown et al., 2020; Zreik

et al., 2020). Since sleep problems are associated with problematic outcomes, the changes in sleep during the Coronavirus pandemic may worsen or contribute to problematic outcomes such as behavioral problems, anxiety, or depression (Becker & Gregory, 2020). In that manner, understanding the interactions in predicting children's sleep behaviors during the pandemic will provide opportunities to understand risk factors better for children's development.

1.1 Theoretical Framework

According to the Bioecological model of human development, child development occurs through bidirectional interactions between the person and the environment within different contexts (Bronfenbrenner & Morris, 2007). In that manner, children's sleep behavior patterns also develop through bidirectional interactions between themselves and the environment. The person represents the biological or individual characteristics of children, their reactions toward their environment (Xia et al., 2020). Child temperament, accounting for individual characteristics, influences the interactions, and as continuously, the developmental outcomes (Bronfenbrenner & Morris, 2007). However, besides children's temperament, environmental factors within immediate or distal interactions influence children's development (Bronfenbrenner & Morris, 2007). The interplay of child temperament and environmental contexts determines how children's sleep behavior patterns may develop. The temperamental characteristics of children create individual differences to engage in sleep behaviors (Carey, 1974). Additionally, the contexts that children engage in sleep behaviors influence how these patterns develop. Further, in children's immediate sleep environment, parents are the main

socializers that could directly influence children's sleep behaviors. In detail, parenting stress could influence parent-child interaction and the organization of children's bedtime routines, which consequently affects children's sleep behaviors (Henderson & Jordan, 2009; Hoyniak et al., 2018). The negative effects of parenting stress on children's bedtime routines, however, could be different depending on children's temperamental characteristics as children benefit better or worse from the environment depending on their temperament (Pluess & Belsky, 2010). Overall, the environmental contexts that interact with temperamental characteristics may have deteriorating or proceeding influences in the development of sleep behaviors (Atkinson et al., 1995; Troxel et al., 2013). Grounding on the Bioecological model, in the current study, the temperamental (person) characteristics (reactivity, persistence, rhythmicity) and contexts (parenting stress, bedtime routines) will be examined as predictors of children's sleep behaviors. In addition, how child temperament interacts with the contexts of parenting stress in predicting bedtime routines and sleep behaviors consequently is examined. Furthermore, it is also aimed to understand how bedtime routines alone could mediate the association between temperament and sleep behaviors as well as between parenting stress and sleep behaviors.

CHAPTER 2

LITERATURE REVIEW

2.1 Sleep Behaviors in Early Childhood

Sleep behaviors in early childhood could be conceptualized as patterns of observed behaviors before, during, and wakings of a child's sleep (Dewald et al., 2010; Hoyniak et al., 2020; Sadeh et al., 2003). Further, these behavioral patterns could emerge as negative or positive depending on children's individual and environmental characteristics (Hoyniak et al., 2015). From this perspective, it is important to examine both positive (e.g., sleep quality) and negative (e.g., sleep problems) aspects of sleep in children.

The quality of sleep is important for several aspects of child development. First of all, both the quality and quantity of sleep have been found to be related to children's cognitive abilities, school adjustment, and performance (Bates et al., 2002; Dewald et al., 2010; Hoyniak et al., 2020; Paavonen et al., 2010; Wolfson & Carskadon, 2003). Consistent sleep onsets (transition into sleep), consistent sleep durations (total amount of sleep), greater sleep quality (well-rested sleep), and lack of daytime sleepiness were associated with attention sustaining abilities (Hoyniak et al., 2015), achievement motivation, and control of aggression in school (Meijer et al., 2000). Additionally, while longer sleep duration improved the children's neurobehavioral functioning including attention, response time, and memory (Sadeh et al., 2003); shorter sleep duration increased inattentiveness, impairs response inhibition, reduces sustained attention (Falone et al., 2001), and lowers academic functioning (Falone et al., 2005). Moreover, children's healthy sleep behaviors

support their self-regulation in terms of goal-directed behavior, executive functioning, and decision-making (Breitenstein et al., 2021). Results from the previous studies indicated that while longer sleep duration was linked with greater cognitive regulation (Cremone et al., 2017), shorter sleep duration had an underpinning role in children's ability to integrate emotional and cognitive regulation (Schumacher et al., 2017). On the other hand, sleep problems such as bedtime resistance (avoid going to bed in time) or night wakings restrain the development of self-regulation in children (Turnbull et al., 2013). In addition, sleep problems are associated with several health problems such as high blood pressure, obesity, diabetes, or immune system problems (Dutil & Chaput, 2017; Kim et al., 2013; Sparano et al., 2019) and associated with depressive symptoms, risk taking behaviors and anxiety symptoms in preschool children (Dahl & Harvey, 2007; Foley & Weinraub, 2017; Hochadel et al., 2014; Maasalo et al., 2016).

The sleep behaviors of children have changed during the COVID-19 pandemic as their daily routines and interactions with people in their context have changed (Bates et al., 2020; Becker & Gregory, 2020; Liu et al., 2020). Findings from the recent studies revealed that children's sleep routines have become inconsistent (Bates et al., 2020), their sleep durations have decreased (Dellagiulia et al., 2020), and the general sleep qualities have also been decreased (Dellagiulia et al., 2020). The inconsistencies in children's sleep quality, including escalated sleep problems, could have adverse effects on their development. To interfere with the possible developmental consequences and to support children's healthy sleep behaviors, the predictors of their sleep problems should be examined and fully

comprehended. The proceeding sections will address some biological, psychological, and socio-contextual predictors of children's sleep behaviors.

2.2 Predictors of Children's Sleep Behaviors

The following sections will explain the roles of children's temperament, parenting stress and children's bedtime routines on children's sleep behaviors.

2.2.1 Temperament and Children's Sleep Behaviors

Temperament is biologically based individual differences in reactivity and regulation in the aspects of attention, affect, and activity that are impacted by maturation and experience over time (Rothbart & Bates, 2007). Individual differences in temperamental differences could be categorized into two main aspects: reactivity and regulation (i.e., persistence) (Rothbart & Bates, 2007; Vassallo & Sanson, 2013). *Reactivity* refers to individual differences in responding to changes in the external and internal environment such as anger, fear, cardiac reactivity, or negative mood tendencies, which are measured by the continuity, intensity, and latency of physical, attentional, and emotional responses (Rothbart & Bates, 2007; Sanson et al., 2004). Being high in reactivity refers to being more disposed to negative reactions, negative mood, irritability, and fear of novelty than less reactive children (Sanson et al., 2004). Aligned with reactivity, *rhythmicity* refers to children's regulatory patterns for basic daily behaviors such as eating, sleeping, or bowel motion (Vassallo & Sanson, 2013). When children's rhythmicity is high, the predictability of the reoccurrence of routines is also high such as having snacks at the same time each day (Prior et al., 1989). *Persistence*, on the other hand, refers to the regulatory component of temperament, which is the mechanism to

modify reactivity (Rothbart & Bates, 2007; Sanson et al., 2004). Being high in persistence refers to being able to adapt responses to control emotional and behavioral tendencies (Rothbart & Bates, 2007).

The temperamental characteristics of children influence their behaviors, later development, and adjustment (Vassallo & Sanson, 2013). Various studies investigated how children's temperamental differences associate with their sleep behaviors. The temperamental features like rhythmicity, persistence, activity level, and reactivity are contributors to the patterns of children's sleep behaviors (Atkinson et al., 1995; Foley & Weinraub, 2017; Goodnight et al., 2007; Scher et al., 1992). According to Scher and colleagues (1992), in both subjective (e.g., mother's sleep diary records) and objective (e.g., actigraphs) measures, temperament predicted children's sleep behaviors. Rhythmicity predicted greater sleep duration and consistent morning awakenings time; approach predicted consistent sleep onsets; adaptability and persistence predicted greater sleep duration; and distractibility predicted lower sleep duration (Scher et al., 1992). Furthermore, reactive children, who had strong emotional reactions to experiences and high in negative affect, suffered greater sleep problems (Bruni et al., 2006; Foley & Weinraub, 2017; Goodnight et al., 2007; Troxel et al., 2013). As children who are high in reactivity are sensitive to the changes within the environment, they get easily distracted or irritated by the changes in heat, light, or darkness (Carey, 1974). On the other hand, temperamental persistence has been found to be associated with consistent sleep behaviors, less sleep onset variability, and greater sleep duration (Molfese et al., 2015).

No study has been found to investigate how sleep behaviors of children are affected depending on their temperaments during the pandemic process. However, as children's temperamental characteristics determine their tendencies to adapt the new environments throughout promoting better or worse coping mechanisms (Rothbart & Bates, 2007), how they adapt to new regulations in the COVID-19 pandemic could be related to their temperamental characteristics (Moccia et al., 2020; Verdolini et al. 2021). During the COVID-19 pandemic, children with high reactivity were found to be displaying increased stress in their daily life (Moccia et al., 2020), while persistence served as a protective mechanism in daily functioning (Verdolini et al. 2021). Grounding on these recent findings, we could speculate that there may be differences in sleep behaviors during the pandemic conditions depending on the temperament of children.

2.2.2. Parenting Stress and Children's Sleep Behaviors

Parenting stress is defined as a process related to being a parent, consisting of the psychological and physiological reactions they experience in order to adapt to the tasks required by having a child (Deater-Deckard, 1998). Since parenting stress influences parenting practices and relationships within the family, it is an important facet of the dynamics among parent, child, and family (Deater-Deckard, 1998). Parenting stress impacts parenting behavior and leads to unwillingness in parenting roles, being less responsive to child needs, being more authoritarian, and poorer parenting approaches (Belsky et al., 1996; Conger et al., 1995; Deater-Deckard & Scarr 1996; McBride & Mills, 1993; McQuillan et al., 2019). Parents who tend to be less responsive to their children due to their parenting stress, have to flexibly adapt

to the needs of a child, and do not provide adequate stimulations for their children to scaffold their optimal development, thus children experience emotional and behavioral problems (Conger et al., 1995; Deater-Deckard & Scarr 1996; McQuillan et al., 2019). Further, as parents organize their children's bedtime routines in early childhood, parenting stress influence the practices, interactions, and involvements of parents in their children's sleep and increases the likelihood of child sleep problems (Kataria et al., 1987). When parenting stress was high, because it was harder for them to effectively organize consistent and adequate bedtime routines that suit for their child, they tended to describe their children's bedtime routines as challenging (De Stasio et al., 2020), and their sleep behaviors as problematic (Sinai & Tikotzky, 2012). Accordingly, children's sleep quality was negatively linked to parenting stress (De Stasio et al., 2020). Children who do not receive sensitive or consistent parenting during bedtime routines need more comfort throughout the night, and that leads to increased night wakings (Chary et al., 2018; Sinai & Tikotzky, 2012), bedtime resistance (Sinai & Tikotzky, 2012), and parasomnias (Temizdemir, 2018). On the other hand, parents whose children have regular sleep patterns experience less parenting stress than those whose children have irregular sleep schedules (Bates et al., 2002). However, the association between parental stress and children's sleep behaviors are bidirectional, and both could foster the one other (Bates et al., 2002; Turnbull et al., 2013). As parent's stress levels influence the children's sleep habits, sleep problems of children also increase parents' stress levels (Chary et al., 2018; Kerr & Jowett, 1994).

Due to living in unpredictable conditions and increased parental roles during the COVID-19 pandemic, the influence of increased parenting stress on children's sleep behavior patterns could be observed (Brown et al., 2020; Zreik et al., 2020). Unwillingness about parental roles, or lack of responsiveness due to overwhelming burdens that are caused by parenting stress, prevents parents from being flexible towards the needs of children in this period and thus may negatively affect children's sleep behaviors (Zreik et al., 2020).

2.2.3 Bedtime Routines and Children's Sleep Behaviors

Bedtime routines are a sequence of observable and repetitive behaviors that occur consistently each night closer to bedtime in a stable environment (Henderson & Jordan, 2009). While bedtime routines emphasize the consistency of routine behaviors like doing the same activities in the same sequence right before sleep, it also points to the consistency of environment like going to bed at a regular time or place with the same caregiver (Henderson & Jordan, 2009). Bedtime routines involve the child and at least one caregiver that could act interactively with the child or remain in a supervisory role during routine activities (Ren & Hu, 2019). These activities may be adaptive (such as reading or listening to a story) or maladaptive (such as watching TV) in terms of fostering or diminishing children's sleep behavior patterns (Henderson & Jordan, 2009). Having a routine before bedtime refers to being predictable and gives an opportunity to a child to mentally prepare for sleep (Bathory & Tomopolous, 2017). The consistency of adaptive behaviors and environment that repeat every day gives a sense of comfort and safety to children that allows and ensures them to safely fall asleep and also teaches them how to fall

back to sleep when they wake during the night (Bathory & Tomopolous, 2017). In that manner, consistent and adaptive bedtime routine behaviors are associated with better sleep quality and reduce problematic sleep behaviors of children (Henderson & Jordan, 2009; Mindell & Williamson, 2018; Prokasky et al., 2019; Ren & Hu, 2019). Regular or positive bedtime routines have been found to be associated with longer sleep durations, reduced night wakings, less bedtime resistance, decreased sleep onset delays, and greater sleep quality among children (Allen et al., 2016; Mindell et al., 2015; Staples et al., 2015). According to Adams & Rickert (1989), following a bedtime routine for six weeks reduced the bedtime resistance of children rapidly. Furthermore, even following a consistent bedtime routine for two weeks led reduction in problematic sleep behaviors in terms of shortening the sleep onset latency, decreasing night wakings, reducing bedtime resistance, and improving overall sleep quality (Mindell et al., 2009). On the other hand, inconsistent or maladaptive activities during bedtime routines have been found to be associated with sleep onset delays and greater night wakings (Fiese et al., 2007; Minndel et al., 2018). For example, watching television, using electronic devices before sleep, or engaging in excessively stimulating activities like active playing, reduces sleep quality, including shorter sleep duration, daytime sleepiness, and sleep onset latency (Brockmann et al., 2016; Henderson & Jordan, 2009; Xu et al., 2016).

While having a routine helps children to feel a sense of comfort and safety (Bathory & Tomopolous, 2017), during unpredictable conditions of the COVID-19 pandemic, routines will provide a great source of predictability and safety to children in order to reassure themselves (Altena et al., 2020). Moreover, as seen

from the studies conducted during the COVID-19 pandemic, disrupted bedtime routines, unscheduled sleep, and wake times negatively influenced children's sleep behaviors and higher levels of sleep problems (Bates et al, 2020; Dellagiulia et al., 2020). Hence, adapting bedtime routines with calming and adaptive activities may be very beneficial during this period in order to foster children's healthy sleep behaviors and development (Altena et al., 2020).

2.3 Integration of Temperament, Parenting Stress, Bedtime Routines and Children's Sleep Behaviors

Individual and contextual factors influence how children's sleep behaviors or problems emerge (Carey, 1974; Hoyniak et al., 2018; Mindell et al., 2015). However, besides the direct influences of these factors, the interactive influences of contributors have to be taken into account in order to more comprehensively understand children's sleep behaviors and their antecedents (Bathory & Tomopoulos, 2017). Although children's temperamental characteristics are associated with their sleep behaviors and problems, how child temperament could be associated with bedtime routines, and in turn, predicts children's sleep behaviors. According to Troxel and colleagues (2013), children who are high in reactivity may be more sensitive and get easily distracted by the inconsistency in bedtime routines. As they get easily distracted, they may resist the organization of bedtime routines, such as not following the events in the same order or not going to bed at the same time. Further, children who are high in reactivity have inconsistent bedtime routines in terms of behaviors and environment (Wilson et al., 2014).

Similar to temperament, how parenting is involved in children's bedtime routines has not been studied much (Ren & Hu, 2019). However, it is known that higher levels of parenting stress are related to more challenging bedtime routines (De Stasio et al., 2020) and more sleep problems in children (Sinai & Tikotzky, 2012). Parents have an important role in maintaining children's bedtime routines (Bathory & Tomopoulos, 2017), however, parents' stress as a part of their parenting could lead them to perceive their children's bedtime routines as more challenging (De Stasio et al., 2020). Additionally, in the context of perceiving challenging bedtime routines, parents with higher levels of stress engaged less in their children's bedtime routines such that they couldn't maintain a set bedtime or engage in specific behaviors before going to bed (Zajicek-Farber et al., 2013).

Even though temperamental and contextual factors are fundamental individual contributors to the emergence of sleep behaviors, the interactions between children's temperament and context may strengthen or weaken the influence of temperament on sleep behaviors (Atkinson et al., 1995). In that manner, we are interested in how temperament and parenting stress interactively predict bedtime routines and sleep behaviors of children. While there has been no study examined the interaction between temperament and parenting stress predicting children's sleep, we could naturally assume that when children have temperamental characteristics that are prone to experiencing sleep problems, parental stress will strengthen the association, given the promising results from previous research regarding their individual influences on sleep problems (Bathory & Tomopoulos, 2017; Wilson et al., 2014). For example, highly reactive children in the context of

punitive parenting approaches during bedtime routines due to parenting stress could display higher sleep problems and lack of sleep quality. On the other hand, temperamentally persistent children may continue business-as-usual bedtime routines regardless of parenting stress as they may cope with inconsistencies in the environment, which in turn could lead them to have quality sleep and less problematic sleep behaviors. In the same vein, temperamental rhythmicity refers to having a predictable, consistent bedtime for children. Consequently, children with low temperamental rhythmicity could be adversely affected by parenting stress, which leads them to display low quality sleep and greater sleep problems. Overall, maintaining consistent bedtime routines could be challenging for parents with temperamentally difficult children (low persistence and high reactivity) (Wilson et al., 2014). As parents who have higher levels of stress may already perceive their children's bedtime routine as challenging (De Stasio et al., 2020), the combinations of parenting stress with temperamental difficulty will make the routines harder so that children will demonstrate low quality sleep and greater sleep problems.

Unprecedented times like the COVID-19 pandemic could make the bedtime routines harder for temperamentally high-maintenance children who are already feeling more stressed (Moccia et al., 2020). In addition, we know that the pandemic process has put a burden on parents and increased their stress levels (Brown et al., 2020; Zreik et al., 2020). From this perspective, maintaining bedtime routines could be harder for parents with escalated stress, and children with a lack of regulation and higher reactivity will adversely be affected by this stress, which consequently leads them to display sleep problems (Altena et al., 2020). Understanding how

parenting stress and child temperament interactively contributes to the children's sleep behaviors during the COVID-19 will pave the way for comprehensive implications for both parents and children.

2.4 The Current Study

2.4.1 The Significance of Current Study

The study contributes to the extension of previous literature and inform the practice regarding children's sleep behaviors. First, no previous study has investigated the interactive contributions of temperament, parenting stress, and bedtime routines in determining children's sleep behaviors, especially during the COVID-19 pandemic. By doing so, tailored interventions could be designed to improve children's sleep quality, which has been evidently shown as effective for their development and learning (Breitenstein et al., 2021; Hoyniak et al., 2020; Sparano et al., 2019). Second, the existing research examined the direct effects of temperament, parenting stress, and bedtime routines on children's sleep behaviors and problems are far from revealing in non-Western contexts, such as Turkey. Although some correlational studies conducted about children's sleep behaviors and problems, they mainly focused on the associations between children's sleep behaviors and developmental outcomes (Cetin, 2009; Sahin, 2017; Tarikdaroglu, 2009), parenting attitudes (Öz, 2018, Sahin, 2017), or media exposure (Öztürk et al., 2018; Temizdemir, 2018; Turna, 2016). Consequently, in addition to direct influences, the moderating roles of parenting stress between child temperament and bedtime routines predicting sleep behaviors should be uncovered. As children's sleep behaviors and bedtime routines were embedded in their sociocultural contexts,

examining the cross-cultural differences in bedtime practices and sleep behaviors is especially important (Gartstein & Putnam, 2018; Milan et al. 2007; Mindell & Williamson, 2018; Owens, 2005). Although sleep behavior problems are universal across cultures, the prevalence rates, etiology, the interpretations of parents, and family practices in bedtime differ (Mindell & Williamson, 2018; Owens, 2005). For example, co-sleeping is perceived differently in collectivistic and individualistic cultures (Owens, 2005). Turkish culture is considered as a spectrum between collectivism and individualism (Sen et al., 2014), thus the consideration of bedtime routine practices and sleep behaviors may vary. Third, bedtime routines have not been examined in Turkey before, thus the bedtime routines questionnaire is translated into Turkish via this study. As the importance of consistent bedtime routines has been evidenced for children's development, the assessment of how parents engage with their children before bedtimes in terms of consistency and adaptive activities, will help professionals and researchers to understand and elucidate the problematic sleep patterns more quickly.

2.4.2 The Purpose of Current Study

The purpose of the current study is to examine how Turkish children's temperament (reactivity, persistence, and rhythmicity), parenting stress, and bedtime routines contribute to children's sleep behaviors. In addition, the moderating role of parenting stress in the association between child temperament and bedtime routines. Finally, we also examined the indirect effects of temperament and parenting stress on sleep behaviors via bedtime routines.

2.4.3 Research Questions of the Study

Considering the purpose of the study, the following research questions and hypotheses are addressed.

RQ1: Do temperamental characteristics of children associate with children's consistency of bedtime routines and sleep behaviors?

H1a: Temperamental reactivity will negatively associate with children's consistency of bedtime routines.

H1b: Temperamental rhythmicity and persistence will positively associate with children's consistency of bedtime routines.

H1c: Temperamental reactivity will negatively associate with children's sleep behaviors.

H1d: Temperamental rhythmicity and persistence will positively associate with children's sleep behaviors.

RQ2: Do parenting stress associate with children's consistency of bedtime routines and sleep behaviors?

H2a: Parenting stress will negatively associate with children's consistency of bedtime routines.

H2b: Parenting stress will negatively associate with children's sleep behaviors.

RQ3: Do consistency of bedtime routines associate with children's sleep behaviors?

H3: Consistency of bedtime routines (consistency of routine behaviors and consistency of routine environments) will positively associate with children's sleep behaviors.

RQ4: Do parenting stress moderates the associations between children's temperament and consistency of bedtime routines?

H4a: Parenting stress will positively moderate the association between temperamental reactivity and consistency of bedtime routines. The association between temperamental reactivity and consistency of bedtime routines will be particularly strong for children whose parents experience greater parenting stress.

H4b: Parenting stress will negatively moderate the association between temperamental rhythmicity and consistency of bedtime routines. The association between temperamental rhythmicity and consistency of bedtime routines will weaken in the context of parenting stress.

H4c: Parenting stress will negatively moderate the association between temperamental persistence and consistency of bedtime routines. The association between temperamental persistence and consistency of bedtime routines will weaken in the context of parenting stress.

RQ5: Are temperamental characteristics indirectly associated with children's sleep behaviors through consistency of bedtime routines?

H5a: Higher levels of temperamental reactivity will lead to inconsistent bedtime routines, which in turn could predict lower levels of sleep behaviors.

H5b: Higher levels of temperamental rhythmicity or persistence will lead to consistent bedtime routines, which in turn could predict higher levels of sleep behaviors.

RQ6: Is parenting stress indirectly associated with children's sleep behaviors through consistency of bedtime routines?

H6: Higher levels of parenting stress will lead to inconsistent bedtime routines, which in turn could predict lower levels of sleep behaviors.



CHAPTER 3

METHODS

3.1 Participants

313 mothers were recruited for the current study. Primarily, the data were screened for 355 participants. Since being a mother was a primary condition for participating in the study, 13 participants who identified themselves as fathers were removed from the data. 10 participants were removed from the study as their children's was not applicable to the predetermined age group. 13 participants were removed from the study because they were only filled out the demographics questionnaire. Lastly, 6 multivariate outliers were found and removed from the study. Hence, prior to preliminary analysis, the final sample consisted mothers of 313 (143 girls) children whose ages ranged between 16 and 84 months old ($M=52.42$, $SD=12.36$). 54.3% of children were the only child in household and the remaining had one (39%), two (4.8%), three (1.6%) or four (0.3%) siblings. A total of 20 mothers reported chronic illnesses of their children, which are allergy ($n=9$), allergic asthma ($n=3$), allergic bronchitis ($n=2$), kidney enlargement ($n=1$), language deficits ($n=1$), epilepsy ($n=1$), thalassemia ($n=1$), cardiac diseases ($n=1$), and premature birth ($n=1$). %10.2 of mothers reported that they have used a sleep education program to organize their children's sleep routines.

Mothers' age ranged from 23 years to 48 years ($M=35.03$, $SD=4.47$) and fathers' age ranged from 27 years to 59 years ($M=38.24$, $SD=5.54$). At the time of data collection, 63.9% of mothers reported themselves as employed, while 36.1% were unemployed. Besides, 97.4% of fathers stated as employed, while 2.6% were

unemployed. For their education levels, a minority (1.9%) of mothers were primary school graduated, 1% of mothers were secondary school graduated, 17.3% of mothers were high school graduated, 63.6% of mothers had an undergraduate degree, 14.7% mothers had master's degree, and 1.6% of mothers had a doctorate. For education levels of fathers, similar to mothers, a minority (0.6%) of fathers were graduated primary school, 4.5% of fathers were graduated secondary school, 20.4% of fathers were graduated high school, 60.4% of fathers were graduated from college, 12.5% of fathers had master's degree, and 1.6% of fathers had a doctorate. A large percentage of mothers reported their marital status as married (94.2%) while 3.5% of the mothers reported as divorced, 1.3% of mothers reported as single, 0.6% of mothers reported as separated and 0.3% of mothers reported themselves as widow. Seven mothers reported a family psychological disorder, which are Obsessive Compulsive Disorder (OCD) (n=2), anxiety (n=2), panic attack (n=2), or unreported (n=1). 54% of mothers reported that they receive a support for childcare. These supports were spouse (n=32), grandmother (n=99), grandfather (n=2), and paid caregiver (n=36). However only 11.8% of mothers reported that they receive support for their children's sleep routines. For their income levels, the majority of parents reported high income, with 1.9% reported a monthly family income of between 2000TL-3000, 4.2% reported between 3001TL-4000, 3.8% reported 4001TL-5000TL, 6.4% reported 5001TL- 6000TL, 6.4% reported 6001TL-7000TL, 8.6% reported 7001TL- 8000TL, 4.5% reported 8001TL- 9000TL, 9.3% reported 9001TL- 10000TL, and 50.8 % reported as 10001TL and higher. A socioeconomic status (SES) variable by averaging the standardized scores (z-scores) of maternal

education, paternal education, and family monthly income was created. This composite SES variable was used in further analyses. Table 1 shows complete demographic information of the participants.



Table 1*Participants' Demographic Information*

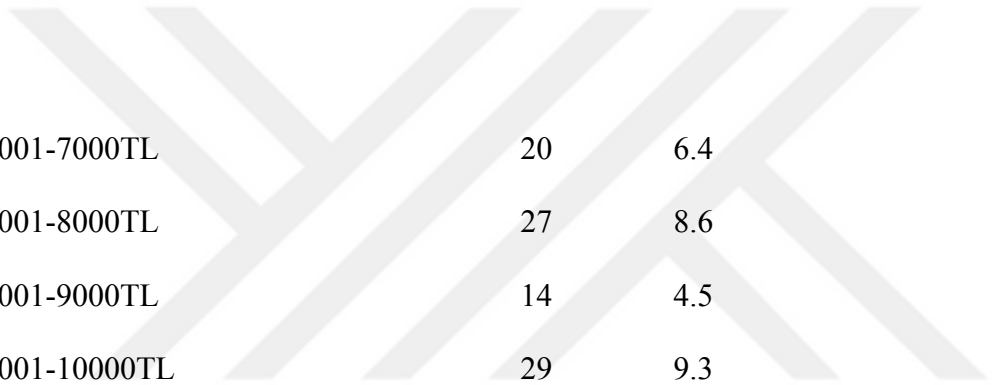
	<i>n</i>	<i>%</i>	<i>Missing (%)</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Child Characteristics						
Gender	307		1.9 %			
Girls	143	45.7				
Boys	164	52.4				
Age (Months)	312		0.3 %	52.42	12.356	16 - 84
Chronic Diseases	313					
Presence	20	6.4				
Absence	293	93.6				
Sleep Program	313					
Yes	32	10.2				
No	281	89.8				

Family Characteristics

Mothers' Age	313		35.03	4.468	23 - 48
Fathers' Age	312	0.3 %	38.24	5.542	27 - 59
Mothers' Occupation Status	313				
Employed	200	63.9			
Unemployed	113	36.1			
Fathers' Occupation Status	312	0.3 %			
Employed	304	97.1			
Unemployed	8	2.6			
Mothers' Education Status	313				
Primary School	6	1.9			
Secondary School	4	1.3			
High School	54	17.3			
Undergraduate	198	63.3			
Master's Degree	46	14.7			

Doctorate	5	1.6
Fathers' Education Status	313	
Primary School	2	0.6
Secondary School	14	4.5
High School	65	20.8
Undergraduate	188	60.1
Master's Degree	39	12.5
Doctorate	5	1.6
Marital Status	313	
Married	295	94.2
Single	4	1.3
Divorced	11	3.5
Separated	2	0.6
Widowed	1	0.3

Psychological Disorder	310		1%
Presence	7	2.2	
Absence	303	96.8	
Social Support	313		
Presence	169	54	
Absence	144	46	
Receiving support for Children's Sleep	73		76%
Presence	37	11.8	
Absence	36	11.5	
Family Income	300		4.2%
2001-3000TL	6	1.9	
3001-4000TL	13	4.2	
4001-5000TL	12	3.8	
5001-6000TL	20	6.4	



6001-7000TL	20	6.4
7001-8000TL	27	8.6
8001-9000TL	14	4.5
9001-10000TL	29	9.3
10001TL+	159	50.8

Note. M = Mean, SD = Standard Deviation.

3.2. Measures

3.2.1 Children's Sleep Behaviors

The Children's Sleep Habits Questionnaire (CSHQ; Owens et al., 2000) was used to screen children's sleep behaviors and problems. Parents reported their children's sleep behaviors in the past week on a 3-point Likert scale (1=rarely to 3=usually). The CSHQ has been used and validated with Turkish children (Fis et al., 2010; İnci et al., 2020). The eight subscales composite a total sleep score; higher scores indicate greater sleep problems ("*Child has trouble sleeping away from home*"). Aligned with the original use of the scale, for the current study, by averaging all items, a total score of sleep behaviors was used. In fact, while higher scores indicate more sleep problems in the original scale, in this study, a total score was created by reversing the items in order to create a positive sleep behavior pattern. Consequently, greater scores indicate higher levels of positive sleep behaviors in children. The internal consistency of the total scale was .80 (Cronbach's alpha) and .77 (McDonald's ω) in the current study.

3.2.2 Bedtime Routines

The Bedtime Routines Questionnaire (BRQ; Henderson & Jordan, 2009) was used to measure children's bedtime routines by parent reports. The original scale was 31-item questionnaire, which has three subscales: consistency (two aspects: routine behaviors and routine environment), activities (two aspects: adaptive and maladaptive), and reactivity. Parents scored their children's behaviors on a 5-point Likert scale (1=almost never to 5=nearly always in the consistency and activity subscales, 1=not at all to 5=extremely in reactivity subscale). The BRQ used

with Turkish children for the first time in this study. The last version of the questionnaire has been through translation, back-translation, and correction procedures. One item was removed (“*In the hour before going to bed, how often does your child say prayers?*”), as it was not inclusionary for whole Turkish families. Confirmatory factor analysis (CFA) was run to examine whether the predefined structure of the scale could be repeated with a Turkish sample. To improve the model fit and conceptual comprehensiveness, items with low factor loadings were removed ($\lambda < .30$; Brown, 2015; Kim & Muller, 1978). The model fit for the final CFA model was acceptable, $\chi^2 (265) = 680.326$ ($p < .001$), CFI = .93, RMSEA = 0.072 (90% CI = 0.065 / 0.078), SRMR = 0.082.

For the purpose of the current study, The Consistency of Routine Behaviors and the Consistency of Routine Environment subscales were used in this study. The Consistency of Routine Behaviors subscale contains four items relating to children’s bedtime routine behaviors (e.g., “*During weeknights, how often did your child perform activities in the same order before going to bed?*”). The Consistency of Routine Environment subscale contains six items relating to children’s bedtime environments (e.g., “*During weeknights, how often did your child get put to bed by the same person?*”). We averaged target items to create each subscale where higher scores mean higher values of that construct. For the current study, the internal consistency (McDonald’s ω) for *consistency of routine behaviors* was $\alpha = .90$, for *consistency of routine environment* was $\alpha = .82$ (see Table 2).

3.2.3 Parenting Stress

The Parenting Stress Scale (PSS; Aydogan & Özbay, 2017) was used to assess parents' stress levels. Parents reported on a 5-point Likert-type scale from 0 (definitely not describes me) to 4 (definitely describes me). PSS is developed, used, and validated in Turkey (Aydogan & Özbay, 2017). The scale has a one-dimensional structure, and higher scores mean higher levels of parenting stress (*"It is hard for me to take a parental role"*). Internal consistency for scale was $\alpha = .96$ in the original study. For the current study, The Cronbach alpha internal reliability was .92 (see Table 2).

3.2.4 Temperament

To measure children's temperament, The Short Temperament Scale for Children (STSC; Prior et al., 1989) was used. Parents ranked their children's behaviors on a 6-point Likert type scale (1=never to 6= always). The Short Temperament Scale for Children (STSC) has been used and validated among Turkish children (Yagmurlu & Sanson, 2009). The *persistence* (*"My child is unwilling to leave a game or activity that he/she has not completed"*), *reactivity* (*"When my child is angry about something, it is difficult to sidetrack him/her"*), and *rhythmicity* (*"After my child is put to bed at night, he/she takes about the same length of time to fall asleep"*) subscales of the STSC were used in the current study. Internal consistency for persistence was $\alpha = .76$, reactivity was $\alpha = .77$, and rhythmicity was $\alpha = .63$. For the current study, internal consistency (Cronbach's alpha) for persistence was .71, reactivity was .75, and rhythmicity was .63 (see Table 2). Even though the internal consistency seemed low for the rhythmicity, this

value was found to be consistent with previous research with Turkish children ($\alpha = .48$ in Yagmurlu & Sanson, 2009 and $\alpha = .63$ in Yagmurlu & Altan, 2010).



Table 2*Descriptive Statistics for Study Variables (N = 313)*

	<i>Internal Consistency</i>	<i>Missing (%)</i>	<i>Min-Max</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Sleep Behaviors	.77	3.2%	1.24-2.36	1.92	.22	-.517	-.083
Bedtime Routine							
Consistency of Routine Behaviors	.90	1.3%	1.00-5.00	3.93	.88	-.823	.347
Consistency of Routine Environment	.82	1.3%	2.00-5.00	4.19	.62	-.858	.772
Parenting Stress*	.92	1%	0.00-0.46	.18	.12	.361	-.613
Temperament							
Persistence	.71	0.3%	1.86-6.00	3.84	.80	-.251	-.312



Rhythmicity	.63	0.3%	2.14-6.00	4.44	.74	-.320	-.306
Reactivity	.75	0.3%	1.00-5.86	2.81	.89	.626	.540
Sleep Time		10.2%	19.00-02.00	21.53	.95	.833	1.85
Wake Time		4.2%	6.00-11.00	7.92	.87	.971	1.12
Total Sleep		5.4%	7.00-14.00	10.36	1.02	.119	.584

Note. Min = Minimum, Max = Maximum, M = Mean, SD = Standard Deviation. *Transformed variable was used.

3.3. Data Collection Procedures

Initially, ethics approval was granted by the Human Research Ethics Committee of Özyegin University. For the purpose of the study, inclusion certain was that participating children would not display any developmental problems as reported by mothers. For the online data collection process, the five questionnaires (Demographics Form, Temperament, Parenting Stress, Bedtime Routines, and Sleep Behaviors) were uploaded to an online data-collecting platform, Qualtrics (Qualtrics, Provo, UT). 210 mothers were recruited by using the snowballing technique through online data collection. The remaining 145 mothers who completed the survey on paper, were reached by contacting to preschools.

In both online and paper surveys, participants were given a consent form, which informed them about their participation was voluntary and their right to withdraw. Furthermore, prior to the study, the duration, purpose, and procedure of the study were mentioned.

3.4 Data Analytical Approach

3.4.1 Data Screening

Prior to main analysis, data were assessed using SPSS 27.0 (IBM Corp. Published 2020) for accuracy of data entry, missing values and the assumptions of multivariate analysis. After checking the accuracy at the item level, composite scores were created for all variables by averaging relevant items.

Missing value patterns for focal variables were tested using Little's (1988) test of Missing Completely at Random (MCAR). The result of MCAR test was significant, $\chi^2(24) = 39.115, p < .05$, which indicated that missing values were not

completely at random. However, missing values ranged from 0.3% to 3.2% across variables (See Table 2). Having 5% or a less missing value is generally ignorable as imputation and listwise deletion would provide similar results (Scafer, 1999; Tabachnick & Fidell, 2007).

Multivariate outliers were analyzed via the Mahalanobis Distance technique (Tabachnick & Fidell, 2007). Six multivariate outliers were detected which were above the Chi-square value, $X^2(11, N = 319) = 31.26, p = .001$, therefore deleted from the data set, leaving 313 participants for further analyses.

Normality assumptions were tested using the criteria of ± 2 skewness and kurtosis (Bryne, 2010; Hair et al., 2010). Skewness and kurtosis scores of variables were in between critical values and acceptable for normality, except parenting stress scores, which were above critical skewness 2 and kurtosis values of 8 (Skewness = 2.66, Kurtosis: 8.17). Consequently, the Box-Cox transformation method was applied to parenting stress scores in order to enhance the normality of the distributions and equalize variances for both outcomes (Box & Cox, 1964). The Box-Cox transformation method is a family of power transformations (different from the classic square root, log, and inverse transformations), which enhance the efficacy of normalizing and variance equalizing for both positively- and negatively-skewed variables (Osborne 2010). Procedures from Osborne (2010) were applied to parenting stress. The finest distribution of the variable produced a skewness of .361 and kurtosis of -.613, which are within acceptable ranges of normality for skewness and kurtosis values.

3.4.2 Multivariate Analytical Approach

Multivariate path analyses were run in the Mplus 8.4 (Muthén & Muthén, 2017). Path analysis use observed variables in the context of structural equation modeling (SEM) (Kline, 2011). Standardized coefficients were used in the path analysis to report effects sizes (Durlak, 2009). We followed a three-step approach to data analyses. First, only-main effects model was run. Second, we tested the indirect effects of temperament on sleep behaviors via bedtime routines. In detail, the direct paths were included from temperament to children's consistency of routine behaviors and routine environments, from temperament to sleep behaviors, from parenting stress to children's consistency of routine behaviors and routine environments, from parenting stress to sleep behaviors, and from children's consistency of routine behaviors and routine environments to sleep behaviors. The significance of indirect effects was examined by using bootstrapping technique (2000 resampling) with 95% confidence intervals (MacKinnon, Fairchild, & Fritz, 2007). Third, we tested the moderating effects of parenting stress for the association between child temperament and bedtime routines. We created interaction terms by multiplying the grand-mean centered of parenting stress and temperamental characteristics (Aiken & West, 1991). Simple slopes analysis was run in *the Mplus 8.4* to understand the nature of the significant interaction (Aiken & West, 1991). In all path analyses, top-down model building was applied, where all possible covariates containing age, child sex and family SES were included in the model, then the non-significant ones removed in order to improve the model fit. We reported final parsimonious models in the results. To test the model accuracy, Comparative fit index (CFI) > 0.90, root mean square error of approximation

(RMSEA) < 0.08 , and standardized root mean square residual (SRMR) < 0.08 are used (Brown, 2006; Kline, 2011).



CHAPTER 4

RESULTS

Preliminary Analysis

Preliminary analyses were run via the SPSS 27.0. Descriptive statistics and the internal consistencies of all variables are displayed in Table 2.

Furthermore, children's going-to-bedtime was ranged from 7.00 p.m. to 2.00 a.m.

($M=9.53$, $SD=.95$). Children's wake time was ranged from 6.00 to 11.00 a.m.

($M=7.92$, $SD=.87$). Correspondingly, the total hours of sleep during night was ranged between 7 to 14 hours ($M=10.36$, $SD=1.02$).

4.1 Bivariate Analysis

The bivariate correlations (Pearson) were directed between children's sleep behaviors, bedtime routine (consistencies of routine environments and behaviors), parenting stress, and children's temperament (persistence, rhythmicity, reactivity).

The correlations among variables are presented in Table 3.

The associations between children's sleep behaviors and bedtime routines were tested. Consistency of routine behaviors ($r(302) = .206$, $p < .01$) and routine environments ($r(302) = .417$, $p < .01$) during bedtime routines are both positively associated with children's positive sleep behavior patterns.

The associations between children's sleep behaviors and parenting stress showed that parenting stress ($r(302) = -.278$, $p < .01$) is negatively associated with children's positive sleep behavior patterns. Further, the association between parenting stress and children's bedtime routines revealed that parenting stress negatively associates with both consistency of routine behaviors ($r(308) = -.145$, p

< .05) and consistency of routine environments ($r(308) = -.135, p < .05$) during bedtime routines.

The association between children's sleep behaviors and children's temperament were tested. Results indicated that persistence and ($r(303) = .200, p < .01$) rhythmicity ($r(303) = .369, p < .01$) were positively, and reactivity ($r(303) = -.279, p < .01$) was negatively associated with children's positive sleep behaviors.

Furthermore, the relationship between bedtime routines and temperament were tested. Results showed that persistence is positively associated with consistency of routine behaviors ($r(309) = .274, p < .01$) and consistency of routine environments ($r(309) = .156, p < .01$) during bedtime routines; rhythmicity is positively associated with consistency of routine behaviors ($r(309) = .406, p < .01$) and consistency of routine environments ($r(309) = .460, p < .01$) during bedtime routines; and reactivity is negatively associated with consistency of routine behaviors ($r(309) = -.204, p < .01$) and consistency of routine environments ($r(309) = -.287, p < .01$) during bedtime routines.

Table 3
The Pearson Correlations of the Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Sleep Behaviors	-										
2. BR Consistent Routine Behaviors	.206**	-									
3. BR Consistent Routine Environment	.417**	.427**	-								
4. Parenting Stress	-.278**	-.145*	-.135*	-							
5. Persistence	.200**	.274**	.156**	-.300**	-						
6. Rhythmicity	.369**	.406**	.460**	-.146*	.210**	-					
7. Reactivity	-.279**	-.204**	-.287**	.415**	-.153**	-.195**	-				
8. Child Age	.100	.080	.075	.006	.052	.069	-.185**	-			
9. Socioeconomic Status	-.050	.244**	.057	-.033	.034	.158**	.017	-.025	-		
10. Total Sleep	.245**	.047	.020	-.144*	.084	.091	-.043	-.234**	-.021	-	
11. Child Sex	-.097	.030	-.022	-.083	.042	-.007	-.115*	.058	-.042	-.005	-

Note. * $p < .05$ (2-tailed), ** $p < .01$ (2-tailed). BR = Bedtime Routines, Child Sex (Girl= 1, Boy = 0).

4.2. Multivariate Analysis

4.2.1 Direct Associations

The final path model using observed variables fit the data very well, χ^2 (13) = 20.425, $p = .08$, CFI = 0.97, TLI = 0.94, RMSEA = 0.04 [90% CI: 0.00–0.07], SRMR = 0.04, AIC (Akaike Information Criterion) = 3419.731, BIC (Bayesian Information Criterion) = 3433.369. In the final model, children's sleep behaviors were predicted by rhythmicity ($\beta = 0.18$, $SE = 0.06$), parenting stress ($\beta = -0.18$, $SE = 0.06$) and consistency of routine environments ($\beta = 0.31$, $SE = 0.06$). Significant covariate for children's sleep behaviors was only child sex, favoring girls ($\beta = -0.12$, $p = 0.02$). Further, consistency of routine behaviors was predicted by persistence ($\beta = 0.19$, $SE = 0.05$), rhythmicity ($\beta = 0.32$, $SE = 0.05$) and reactivity ($\beta = -0.13$, $SE = 0.06$). Covariate for consistency of routine behaviors was only family SES ($\beta = 0.18$, $p < .05$). Finally, consistency of routine environments was predicted by rhythmicity ($\beta = 0.43$, $SE = 0.05$) and reactivity ($\beta = -0.19$, $SE = 0.06$). See Figure 1 for complete significant associations. Although the direct associations of temperamental persistence, reactivity and consistency of routine environments on children's sleep behaviors were tested, there was no significant effect. Furthermore, the direct effect of parenting stress on consistency of routine behaviors and environments were not significant.

4.2.2 Indirect Associations

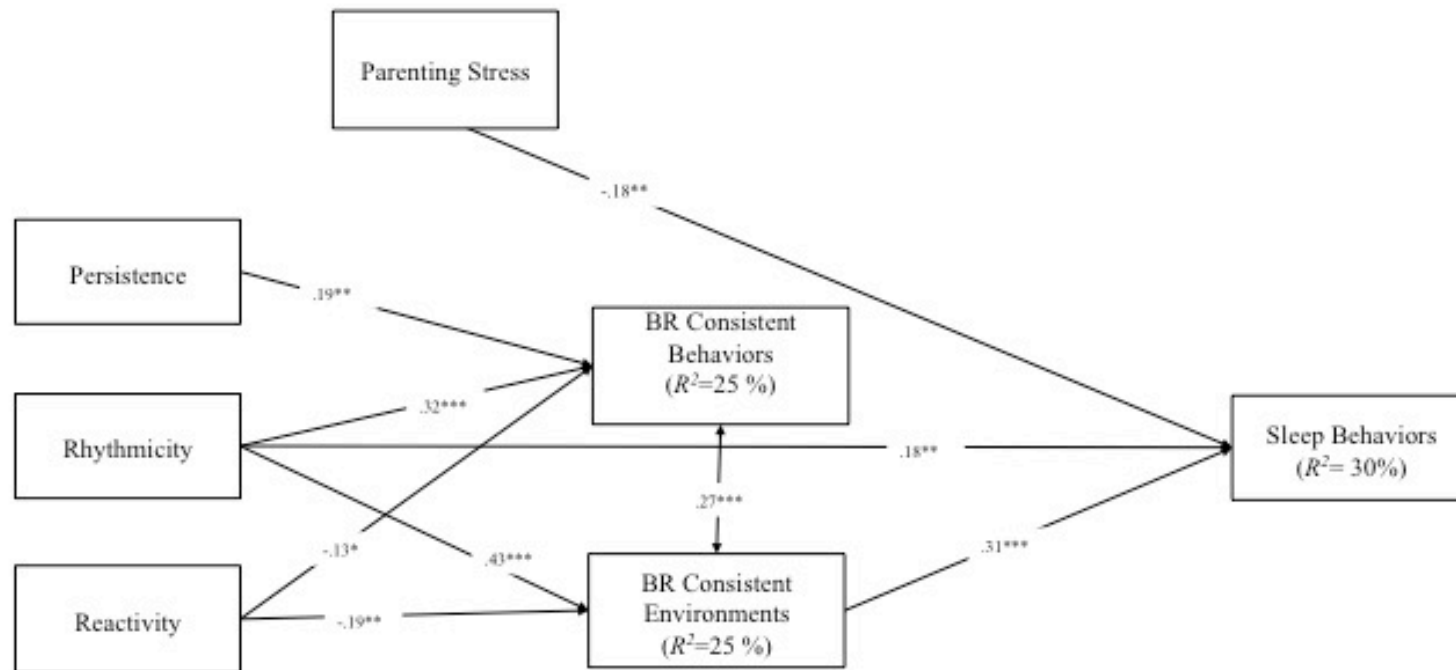
The indirect effects of temperamental characteristics (persistence, rhythmicity, reactivity) and parenting stress in the associations between bedtime

routines and children's sleep behaviors were tested using 2000 bootstraps with 95% CIs. There was a significant indirect effect of temperamental rhythmicity ($\beta = 0.13$, [95% CI: 0.075 / 0.197] and reactivity ($\beta = -0.06$, [95% CI: -0.106 / -0.025] to children's sleep behaviors via consistency of routine environments. See supplementary document for graphical depictions of bootstrap distributions with bias-corrected 95% credible confidence intervals. Even though the indirect effects of temperamental persistence and parenting stress on children's sleep behaviors via the consistency of routine behaviors and environments were analyzed, the results were not significant. As the data were not collected longitudinally, one should interpret these findings only as indirect effects rather than pure mediation (Agler & Boeck, 2017).

Overall, children who had higher levels of temperamental rhythmicity tended to have consistent routine environments and, in turn, these consistent routine environments predicted higher values of sleep behaviors. In addition, children who had higher levels of temperamental reactivity tended to have inconsistent routine environments and, in turn, these children experienced lower levels of sleep behaviors.

Figure 1

The structural model with standardized coefficients.



Note. $*p < .05$; $**p < .01$; $***p < .001$. The significant paths were displayed. BR= Bedtime Routines. Covariates: Female for Sleep Behaviors ($-.12$), SES for BR Consistent Behaviors ($.18$).

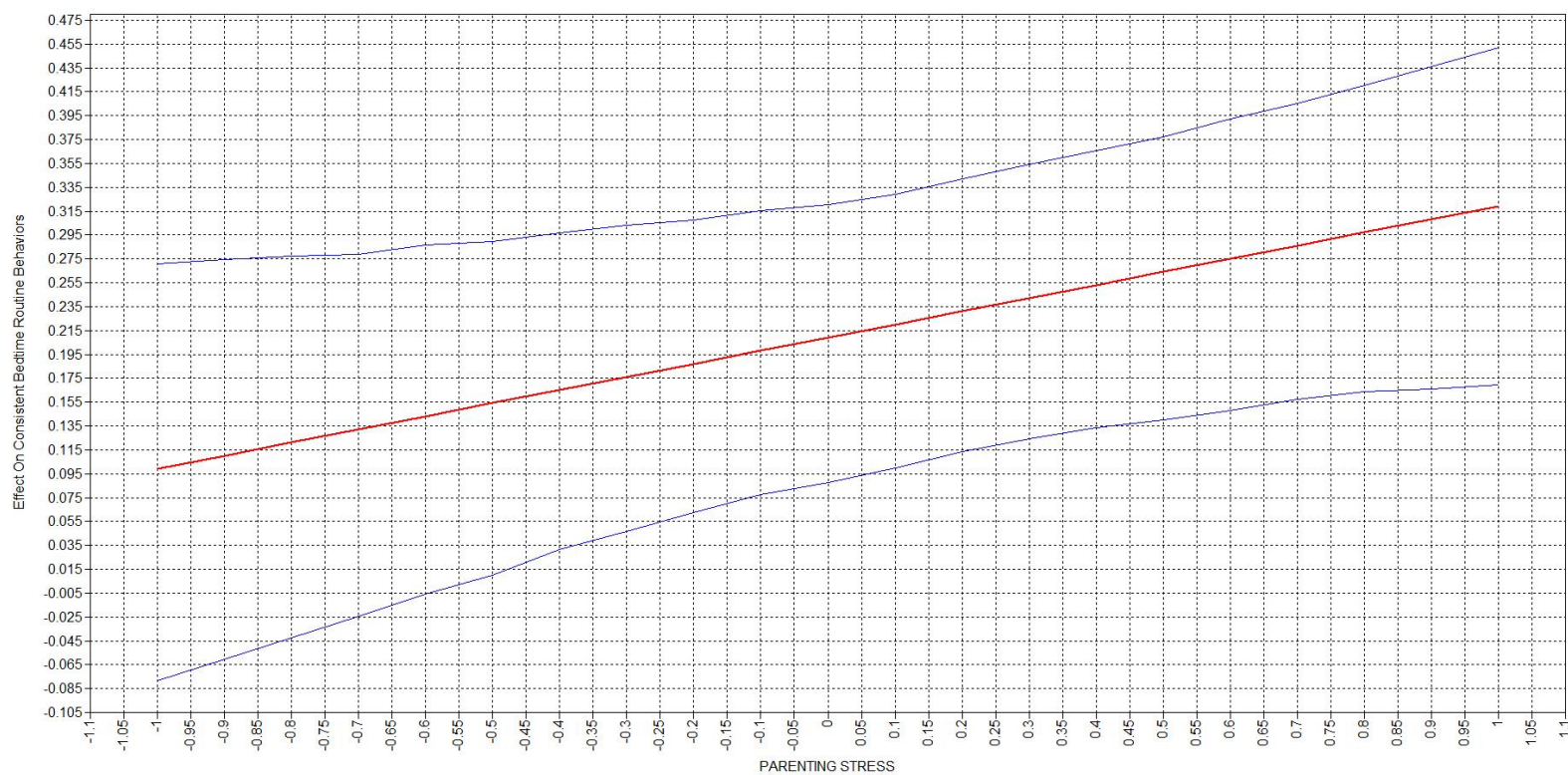
4.2.3 Moderation Results

Two-way interaction terms between temperamental characteristics and parenting stress included to model to investigate the strength of the associations when predicting children's consistency of routine behaviors and environments. The moderating effect of parenting stress between the links of temperamental characteristics (persistence, rhythmicity, reactivity) and bedtime routines (consistency of routine behaviors and environments) were tested. The results revealed that only the interaction between parenting stress and persistence was significant in predicting children's consistency of routine behaviors ($\beta = .11$ (SE = .056), $t = 2.046$, $p = .04$).

To understand the nature of the interaction, the associations between persistence and consistency of routine behaviors at three levels of parenting stress, which are high (1 SD above the mean), the mean, and low (1 SD below the mean) were plotted. The results showed that the slope for persistence on children's consistency of routine behaviors when parenting stress was low ($t = 1.105$, $p = .27$) was not significantly different from the zero. However, when parenting stress was at average ($t = 3.484$, $p < .001$) and high ($t = 4.438$, $p < .001$), the slope for persistence was significantly different from zero. Consequently, when parenting stress was low, persistence was unrelated to consistency of routine behaviors. On the other hand, when parenting stress was average and high, higher persistence was related to more consistent routine behaviors (See Figure 2).

Figure 2

The Interaction Between Persistence and Parenting Stress in Predicting Children's Consistency of Routine Behaviors on Bedtime Routines



CHAPTER 5

DISCUSSION

The purpose of the present study was to understand the direct and indirect contributions of children's temperament (reactivity, persistence, and rhythmicity), parenting stress, and bedtime routines to children's sleep behaviors with a further interest in examining the moderating role of parenting stress between child temperament and bedtime routines. In the present study, six main findings emerged. First, in bivariate and multivariate analysis temperamental characteristics (reactivity, persistence, and rhythmicity) were associated with children's consistency of bedtime routines. Second, in bivariate and multivariate analyses, rhythmicity was positively associated with sleep behaviors. Third, in bivariate and multivariate analyses, parenting stress was negatively associated with children's sleep behaviors. Fourth, in bivariate and multivariate analyses, consistency of bedtime routine environments was positively associated with children's sleep behaviors. Fifth, rhythmicity and reactivity indirectly influenced children's sleep behaviors through consistency of bedtime routine environments. Lastly, parenting stress moderated the association between persistence and consistency of bedtime routine behaviors. In the following sections, each of these findings will be discussed.

5.1. Children's Temperament and Bedtime Routines

The research's first question was aimed to examine the association between children's temperament with their bedtime routines. It was hypothesized that persistence and rhythmicity would be positively associated with children's consistency of bedtime routine behaviors and environments. In contrast, reactivity

would be negatively associated with children's consistency of bedtime routine behaviors and environments.

Primarily, persistence and rhythmicity were positively related to the consistency of bedtime routine behaviors, additionally, rhythmicity was also positively related to the consistency of bedtime routine environments. These findings confirmed the hypothesis and coherent with previous research indicating that regulatory temperament (persistence and rhythmicity) could be associated with more consistent bedtime routines. According to Wilson et al., (2014), regulatory temperamental characteristics (higher inhibitory control and attention focusing) predicted much more regular bedtime routine behaviors. The internal mechanisms to regulate daily behaviors and emotional tendencies of children predict regularly ordered and consistent bedtime routine behaviors like performing the same activities in the same order before going to bed. In addition, the fact that rhythmicity was also positively related to the consistency of bedtime routine environments could be explained by the nature of rhythmicity, which is defined as regulating daily activities, would predict the tendency of children to perform their bedtime routines at the same time, in the same place, and with the same person (Vassalo & Sanson, 2013).

Second, similar to the expectations, reactivity was negatively related to both consistencies of bedtime routine behaviors and consistency of bedtime routine environments. This finding is in accordance with previous research revealing that higher reactivity is a predictor of problematic bedtime routines such as bedtime resistance, inconsistent bedtimes or inconsistent bedtime environments like parents'

beds (Reid et al., 2009; Troxel et al., 2015; Wilson et al., 2014). As the notion behind being high in reactivity refers to being prone to negative emotionality and difficulty in behavioral control, it leads to resistance and inconsistencies in performing the same activities in the same order, or in the same place at the same time while getting ready for the bed (Atkinson et al., 1995; Reid et al., 2009; Troxel et al., 2015). The high reactivity toward the occurrence of random frustrations at home could lead to the progression of various day-to-day bedtime routine practices or times. For example, when a high-reactive child goes to the kitchen to drink water heading to the bed while bedtime routine and sees that one of his/her favorite animal-print glass is dirty, parents may experience a power struggle over drinking from a different glass. Thus, as their tendency to experience negative emotionality at lower-threshold and much more intense (Troxel et al., 2015), it may take a while to calm him/herself down and compromising with parent to go to bed.

5.2. Children's Temperament and Sleep Behaviors

The first research question was also aimed to understand the association between children's temperament with their sleep behaviors. In the light of this purpose, it was hypothesized that persistence and rhythmicity would be positively associated with children's positive sleep behaviors. In contrast, reactivity would be negatively associated with children's positive sleep behaviors. The findings of the study partially confirmed the expectations by showing that rhythmicity is positively associated with children's sleep behaviors. This finding is in line with previous research indicating the predictions of rhythmicity to positive sleep behaviors such as sleep duration or consistent sleep onsets (Scher et al, 1992). Nonetheless, as the

description of rhythmicity contains regularity in daily activities including sleep, this finding could be considered as a natural result. The rhythmicity characteristic of temperament was considered as a contributor and consolidation of children's sleep behaviors (Anders & Keener, 1985; Van Tassel, 1985).

Unexpectedly, persistence and reactivity did not directly predict children's sleep behaviors. This result is inconsistent with what was expected, as previous research indicated that persistence and reactivity were linked with sleep behaviors (Goodnight et al., 2007; Scher et al., 1992). However, any speculative interpretations of this inconsistent finding in the cross-sectional study context should be avoided. Further investigation of these associations in the Turkish context could be needed.

5.3. Parenting Stress and Sleep Behaviors

The second research question was aimed to investigate the association between parenting stress and children's sleep behaviors. Considering this aim, it was hypothesized that parenting stress will negatively associate with children's sleep behaviors. The findings of the research corresponded the expectations by indicating that parenting stress was negatively related to children's sleep behaviors. Thus, the results were consistent with previous work that underlies the negative relationship between parenting stress and children's sleep behaviors (De Stasio et al., 2020; Kataria et al., 1987; Meltzer & Mindell, 2007). The environmental stress that children indirectly exposed through parents (Meltzer & Mindell, 2007) undermines their sleep quality and leads negative sleep behaviors in children such as night wakings or bedtime resistance (Chary et al., 2018; Sinai & Tikotzky, 2012).

5.4. Bedtime Routines and Sleep Behaviors

The third research question was intended to understand the association between children's bedtime routines and sleep behaviors. It was hypothesized that consistency of bedtime routine behaviors and consistency of bedtime routine environments would be positively associated with sleep behaviors. Partially supporting the expectation, the results of the study revealed that consistency of bedtime routine environments was positively associated with children's sleep behaviors. This finding was in line with previous research that emphasized the importance of consistency of routine environments, especially for healthy sleep behaviors (Bathory & Tomopolous, 2017). The consistency of environmental factors like having a predictable time and place during bedtime is critical for early childhood sleep behaviors as it gives them predictability (Bathory & Tomopolous, 2017).

Unexpectedly, the consistency of routine behaviors was not directly related to sleep behaviors. Although no conclusion could be drawn from a single cross-sectional study, one of the reasons may be that previous studies evaluated the consistency of bedtime routines as total consistency. Rather than separating the consistency of routine behaviors and environments, a total routine consistency was used in analyses (Staples et al., 2015; Ren & Hu, 2019). According to the Henderson & Jordan (2009), consistency of routine behaviors could be perceived as a setting for subsequent acquiescence with a predictable order of activities. On the other hand, consistency of environment acts as discriminative stimuli for the acquiescence (Henderson & Jordan, 2009). Although Henderson & Jordan expected

that consistency of the environmental factors would strength the quality of bedtime routine, empirical studies did not examine the individual contributions of these environmental aspects. Studies emphasized the importance of performing the same activities in the same order as well as performing them at the same time, in the same environment with the same person for intervening in children's sleep problems (Henderson & Jordan, 2009; Mindell et al., 2009; Staples et al., 2015). The general consistency of a bedtime routine gives children a sense of safety, decreases arousals, and reduces sleep problems such as night wakings, sleep onset delays, or sleep duration (Mindell & Williamson, 2018; Staples et al., 2015; Ren & Hu, 2019). However, to understand adequate implications, dividing bedtime consistency into two different sub-headings as behaviors and environmental factors will produce a more systematic perspective to the literature to develop appropriate intervention programs (Henderson & Jordan, 2009). According to results from the current study, consistency of routine environments related to sleep behaviors whereas consistency of routine behaviors was not. Further investigations are needed to understand how these two different entities contribute sleep behaviors individually.

5.5. Indirect Effects of Temperament on Sleep Behaviors via Bedtime Routines

The fifth research question was to explore the indirect association of temperament with children's sleep behaviors through bedtime routines. It was hypothesized that higher levels of temperamental reactivity would lead to inconsistent bedtime routines (consistency of routine behaviors and environments), which in turn, predict lower levels of sleep behaviors. On the other hand, it was also hypothesized that higher levels of temperamental rhythmicity or persistence would

lead to consistency of bedtime routines (consistency of routine behaviors and environments), which in turn, predict higher levels of sleep behaviors. Consistent with assumptions, the results of the study revealed that rhythmicity predicted greater sleep behaviors via consistent bedtime routine environments. Whereas reactivity predicted lower levels of sleep behaviors via inconsistent bedtime routine environments. Even though no previous research has examined the indirect associations between temperament and sleep behaviors through bedtime routines, the results of the study are concurrent with previous studies that examined the relationship between bedtime routines with temperament and sleep behaviors, which indicated that bedtime routines are related with both children's temperament and their sleep behaviors (Wilson et al., 2014).

Temperamental rhythmicity creates a preceding effect for routines through the regular circadian rhythm, which creates a biologically automatic routine environment for bedtime (Raizen et al., 2006). The rhythmicity characteristic of temperament support how children follow bedtime routines consistently. Children with high rhythmicity could ease themselves more quickly and get back to the routine on their own, despite of the different environmental events that they experience before bedtime that may cause them to become angry or excited, thus the consistency of their bedtime routine environment could be maintained (Molfese et al., 2015). Further, in previous studies rhythmicity predicted positive sleep behaviors such as fewer night wakings, consistent morning wakings, or greater sleep duration (Raizen et al., 2006; Scher et al., 1992). Combining these, in the current study, the indirect influence of rhythmicity on sleep behaviors via the consistency of

bedtime routine environments is demonstrated. Temperamental rhythmicity leads to consistent bedtime routine environments, in turn; the predictability of routine environments leads positive sleep behaviors.

The negative relationship between reactivity to sleep behaviors via the consistency of routine environments was also partially supported by previous research, which demonstrated the associations of temperament with bedtime routines and sleep behaviors (Troxel et al., 2013; Wilson et al., 2014). Children who are highly reactive and emotionally negative are expected to have problems with bedtime routines, it may be because they resist going to bed at the same time consistently, and have difficulties with calming and self-soothing needed to fall asleep (Reid et al., 2009; Troxel et al., 2013; Wilson et al., 2014). In connection with the different environmental factors that experienced in daily life, the resistance of children with reactivity to consistent routine environments in terms of time and place may vary on a daily basis (Troxel et al., 2013). Consequently, the inability to provide these consistent sleep environments predict sleep behavior problems such as night waking, sleep duration, sleep onset delay, and sleep anxiety (Reid et al., 2009). In short, temperamental reactivity undermines consistent bedtime routine environments, in turn, the chaotic of bedtime routine lead to problematic sleep behaviors.

5.6. Moderating Role Parenting Stress between Temperament and Bedtime Routines

The fourth research question aimed to explore parenting stress's moderating role between children's temperament and bedtime routines. It was hypothesized that

parenting stress would positively moderate the association between reactivity and consistency of bedtime routines, on the other hand, would negatively moderate the associations between persistence, rhythmicity, and consistency of bedtime routines. The results of the current study revealed that parenting stress moderated the association between temperamental persistence and consistency of routine behaviors. Specifically, parenting stress strengthened the association between persistence and consistency of bedtime routine behaviors. Persistence served as a protector factor for remaining the consistency of bedtime routine behaviors in the existence of parenting stress. To explain comprehensively, when children with high persistence were exposed to low parenting stress, they did not display significantly higher bedtime routines compared to children with low persistence. However, when children with high persistence were exposed to greater parenting stress, they displayed more consistent bedtime routine behaviors. The finding is in accordance with the explanations of Derrybery and Rothbart (1997) that children with regulatory temperament (persistence) could be able to avoid negative environmental stimuli and enhance to direct their attention and behavior toward adaptive functioning. For example, in the study of David and Murphy (2007), the regulatory characteristics of preschool children's temperament predicted greater social relations despite of high amounts of interparental conflict. The regulatory temperament served as a buffer and helped children to shift their attention and emotion from the upcoming negative emotions or behaviors of parents toward each other, into more positive aspects of the environment (David and Murphy, 2007). This temperamental regularity gives a capability to inhibit reactivity, and motivate

the necessary behavior that is needed to adapt even the undesirable circumstances (Eisenberg et al., 2003), which is especially a protective factor for the survival of children in negative environments (Derryberry & Rothbart, 1997). In line with this perspective, in the current study, persistence predicted greater consistency of routine behaviors despite of high amounts of parenting stress. Children with high persistence may have the ability to disengage from the adverse influences of parenting stress and be able to modify their attention to sustain their bedtime routine behaviors by themselves like performing the same activities in the same order. Rather than being preoccupied with the side effects of parenting stress, children with high persistence may motivate themselves with the feeling of safety and predictability of performing consistent bedtime routines.

5.7. Making Sense of the Results in the Context of the COVID-19 Pandemic

The current study has an important place in terms of examining temperament, parenting stress, bedtime routines, and children's sleep behaviors during the COVID-19 pandemic. As the COVID-19 outbreak has changed the dynamics within the family and increased parenting stress (Brown et al., 2020), it obstructed parents' ability to engage in children's sleep behaviors compared to the past, so it is important to pay further attention to support children to decrease the risk factors of negative sleep behaviors. In that manner, policymakers could organize free psychoeducation for families to manage parenting stress during the pandemic in order to protect families from the negative effects of COVID-19 and to increase the well-being of families and children.

The present study provided evidence addressing the indirect influence of children's temperament on their sleep behaviors through consistency of bedtime routine environments during the COVID-19 outbreak. Previous studies have shown the importance of consistency in bedtime routines for children's sleep behaviors (Bathory & Tomopolous, 2017; Mindell et al., 2009; Staples et al., 2015). Thus, having a consistent bedtime routine environment during the Covid-19 pandemic might help children to feel comfortable and safe (Altena et al., 2020). For enabling a predictive and safe home environment, consistent bedtime routines may serve as a protective factor for families during the COVID-19 outbreak. Based on the findings of the current study that show the importance of consistent bedtime routines for sleep behaviors, especially for children with reactive temperament, online supporting programs for parents could also be beneficial to improve and maintain consistent bedtime routines for their children. In brief, effective interventions and more research are needed to reduce the current and long-term influences of COVID-19 on parenting stress, children's bedtime routines, and sleep behaviors.

5.8 Implications of the Current Study

In the current study, the predictors of Turkish children's sleep behaviors were examined in the context of temperament, bedtime routines, and parenting stress. Given the importance of sleep behaviors for children's development (Breitenstein et al., 2021; Hoyniak et al., 2020; Sparano et al., 2019), findings from the current study may offer some implications for parents, practitioners, and researchers. Primarily, the findings of this study provided an understanding of children's sleep behaviors from the perspective of the Bronfenberenner and Morris's

bioecological model of human development (2007), wherein the bidirectional interactions between the individual and the context contribute to children's sleep behaviors. Further, the current study examined the associations within the Covid-19 context. As within-family routines were disrupted due to the pandemic circumstances, children's bedtime routines become more inconsistent and in turn, their sleep behaviors are affected negatively (Bates et al, 2020; Dellagiulia et al., 2020). Examining the direct, indirect, and combined influences of temperament, parenting stress, and bedtime routines on children's sleep behaviors could have leading benefits.

Grounding on the current study, maintaining consistent bedtime routines would help children to promote better sleep behaviors, especially for children with high reactivity. Previous research supported that consistent bedtime routines are important for healthy sleep behaviors (Henderson & Jordan, 2009; Mindell & Williamson, 2018; Prokasky et al., 2019; Ren & Hu, 2019). Intervention studies that are focused on maintaining adaptive and consistent bedtime routines revealed that children who follow consistent adaptive bedtime routines experience improvement in sleep behavior including sleep duration, night wakings, bedtime resistance, and sleep onset (Burke et al., 2004; Milan et al., 1982; Mindell et al., 2006; Mindell et al., 2009; Seymour et al., 1983). Behavioral interventions such as Positive Routines (Milan et al., 1982) about bedtime routines or parent education programs about bedtime routines produced durable and reliable changes, showing that reviewing in 52 studies, 82% of children maintained healthy sleep behaviors in 3 to 6-month follow-up (Mindell et al., 2006). For example, in the study of Seymour et al.,

(1983), intervention program included an organized bedtime routine, which emphasized the importance of both consistencies of routine behaviors and routine environments, parenting education programs about parenting practices in settling children revealed that children's sleep behaviors and daytime behaviors improved, even when controlling in the 6-month follow-up. Moreover, designing app-based or online intervention programs about bedtime routines could help professionals to reach parents far more broadly. For example, an internet-based bedtime routine intervention program that organized a prescribed bedtime routine for parents established improvements in children's sleep behaviors and sustained to be efficacious one year later (Mindell et al., 2011). In addition, an automated text-messaging system with parents in the hour before bed to set bedtime routines for children demonstrated effectiveness and feasibility in the initial test (Kitsaras et al., 2020). In the light of these findings, integrating app-based bedtime routine organizers in Turkey could be supportive for parents and children. While this application could contain results of empirical studies that emphasize the importance and predictors of children's sleep behaviors, it may also help parents to organize a consistent, adaptable bedtime routine for their children with parents by evaluating children's bedtime routine patterns with the Bedtime Routine Questionnaire. In addition, it may also offer a daily checklist that allows parents to monitor and control the bedtime routine that they establish.

5.9. Strengths, Limitations, and Future Directions

The primary strength of this study is the contribution to the literature by examining integrative influences of temperament, parenting stress, and bedtime

routines on children's sleep behaviors, particularly in the times of the COVID-19 pandemic. To our knowledge, there has been no previous study investigating these direct and indirect influences on children's sleep behaviors, particularly in non-Western countries.

Nonetheless, there are some limitations in the current study that should be considered when interpreting the results. First, our study used a cross-sectional design, which limits the capacity to talk about the causal implications of direct and indirect paths. Future studies should examine the model with a longitudinal design to make causal interpretations. Second, all measurements were based on maternal reports, which could lead to rater bias in assessments. To overcome this problem, future studies may utilize different measurement techniques such as observation or other caregiver reports. Third, the parents in the current study were largely from medium to high-income families, which may limit the generalizability of the findings, as they do not represent all SES groups. Families with high SES may have been not badly affected by the COVID-19 conditions as compared to low SES families. Children with low SES backgrounds may experience more negative sleep behaviors. Thus previous research revealed that children in low SES families are in greater risk for sleep problems and low SES is related with sleep problems through family stressors (Burström & Tao, 2020). Future studies may increase the generalizability of the study by including families from all SES levels equally. Lastly, in future studies, the model's applicability to different timelines should be tested to examine the results different than the Covid-19 context.

APPENDIX A

(Demographics Questionnaire)

EBEVEYN KİŞİSEL BİLGİLER

Lütfen anaokulu döneminde bulunan çocuğunuzu göz önünde bulundurarak aşağıdaki soruları cevaplandırınız.

Formu Doldurduğunuz Tarih:/...../.....

Formu Dolduran Kişi: Anne () Baba ()

Çocuğunuzun yaşı: (ay olarak) **Çocuğunuz Cinsiyeti:** () Kız () Erkek

Çocuğunuzun Doğum Tarihi:/...../.....

Çocuğunuzun kronik bir rahatsızlığı/hastalığı veya gelişimsel bir bozukluğu var mı? Evet () Hayır ()

Varsa yazınız

Çocuğunuzun uyku düzeni için daha önce bir uyku eğitimi programından yararlandınız mı? Evet () Hayır ()

Başka bir çocuğunuz var mı? Evet () Hayır () **Evet ise sayısı:**

Anne Yaş..... Baba Yaş.....

Şu anda anne çalışıyor mu? Evet () Hayır ()

Şu anda baba çalışıyor mu? Evet () Hayır ()

Anne Eğitim Durumu:

İlkokul () Ortaokul () Lise () Üniversite () Yüksek Lisans () Doktora ()

Annenin şu ana kadar almış olduğu toplam eğitim süresi: (Yıl olarak)

Baba Eğitim Durumu:

İlkokul () Ortaokul () Lise () Üniversite () Yüksek Lisans () Doktora ()

Babanın şu ana kadar almış olduğu toplam eğitim süresi: (Yıl olarak)

İlişki durumunuz nedir?

Bekâr () Evli () Boşanmış () Ayrı () Tekrar evlenmiş () Dul () Birlikte yaşama ()

Anne veya babanın herhangi bir psikiyatrik/psikolojik rahatsızlığı var mı?

Evet () Hayır ()

Varsa yazınız

Anne veya babanın uyku problemi var mı? Evet () Hayır ()

Varsa yazınız

Çocuk bakımında destek aldığınız (eş, büyükanne, büyükbaba, yardımcı vs.)

biri var mı? Evet () Hayır () Varsa yazınız

.....

Bu kişi çocuğunuzun uykusu ile ilgili (uyku rutinini düzenleme, uygulama vb.)

size destek oluyor mu? Evet () Hayır ()

2000TL ve altı	
2001-3000 TL	
3001-4000 TL	
4001-5000 TL	
5001-6000 TL	
6001-7000 TL	
7001-8000 TL	
8001-9000 TL	
9001-10000 TL	
10000 TL ve üstü	

APPENDIX B

(Children's Sleep Habits Questionnaire)

ÇOCUK UYKU ALIŞKANLIKLARI ANKETİ (örnek maddeler)

Aşağıdaki cümleler çocuğunuzun uyku alışkanlıklarını ve uykuyla ilişkili muhtemel zorluklarını içermektedir. Geçen haftayı düşünerek bu sorulara cevap veriniz. Eğer geçtiğimiz hafta bir nedenle (çocuğunuzun ateşli bir enfeksiyonu olmuş olabilir ve iyi uyuyamamış olabilir ya da örneğin taşınma ya da tadilat nedeniyle ev yaşantınızda düzen değişikliği yaşanmış olabilir) her zamanki yaşantı düzeninizden farklı geçti ise o zaman normal düzeninizde yaşadığınız en son haftayı düşünerek soruları yanıtlayınız.

Eğer bir durum haftada 5-7 kez oluyorsa **GENELLİKLE**, 2-4 kez oluyorsa **BAZEN**, 1 kez oluyor ya da hiç olmuyorsa **NADİREN** şeklinde cevap veriniz. Ek olarak, her bir satırda söz edilen uyku alışkanlığı size göre sorun yaratıyorsa “evet”, yaratmıyorsa “hayır”ı yuvarlak içine alınız.

(Sample Items)

	3 Genellikle (5-7)	2 Bazen (2-4)	1 Nadiren (0-1)
1. Yatağa her gece aynı saatte gider	☐	☐	☐
24. Uykuda bir kez uyanır	☐	☐	☐

APPENDIX C

(The Bedtime Routines Questionnaire)

UYKU VAKTİ RUTİNLERİ ANKETİ (örnek maddeler)

Çocuklar uyku vakitlerinde çeşitli davranışlar gösteririler. Bakım veren kişiler çocuklar uykuya geçmeden önce, onlar ile birlikte belirli günlük aktiveleter (örneğin, yıkanmak, diş fırçalamak, hikaye okumak/dinlemek, müzik dinlemek) yaparlar.

Aşağıda size çocuğunuzun uyku vaktinde gösterdiği bazı davranışlar gösterilmiştir. Bu davranışları geçen tüm ayı göz önünde bulundurarak, aşağıda verilen ölçekler üzerinde değerlendiriniz.

Her soru grubu için daha detaylı bilgilendirme verilmiştir.

Geçtiğimiz ay boyunca, hafta içi geceleri (sadece pazar gününden perşembe gecesine kadar), çocuğunuz ne sıklıkla...	Ne sıklıkta olur?				
	1=Neredeyse hiçbir zaman 2=Nadiren 3= Bazen 4= Çoğu zaman 5= Neredeyse her zaman				
1) ...uykudan önceki saat içinde aynı aktiviteleteri yapar (örneğin, yıkanmak, diş fırçalamak, hikaye okumak/dinlemek, müzik dinlemek)?	1	2	3	4	5
2) ...uykudan önceki aktiviteleteri aynı sırayla gerçekleştirir (örneğin, yıkanmak, diş fırçalamak, hikaye okumak/dinlemek, yatağa gitmek)?	1	2	3	4	5
3) ... aynı yerde uyur (örneğin kendi yatağında, ebeveyn yatağında, kanepede)?	1	2	3	4	5

APPENDIX D

(The Parenting Stress Scale)

Ebeveynlik Stres Ölçeği (örnek maddeler)

Aşağıdaki ifadeler ebeveynlik ya da anne baba olmaya ilişkin yaşamış olduğunuz stres durumlarını belirtmektedir. Soruları cevaplarken lütfen COVID-19 sürecindeki karantina dönemlerini göz önünde bulundurunuz. Her bir maddede sizin için en uygun olan ifadeyi işaretleyiniz.

(0) Hiç Tanımlamıyor (1) Biraz Tanımıyor (2) Oldukça İyi Tamamlıyor (3) İyi Tanımıyor (4) Çok İyi Tanımıyor

- | | | | | | |
|---|----------|----------|----------|----------|----------|
| 2. Çocuğumla iyi bir iletişim kurmayı başaramıyorum. | 0 | 1 | 2 | 3 | 4 |
| 6. Çocuğum yakın çevresiyle ilişkilerinde problemlere sahiptir. | 0 | 1 | 2 | 3 | 4 |

APPENDIX E

(The Short Temperament Scale for Children)

Çocuklar için Kısa Mizaç Ölçeği (örnek maddeler)

Her bir soru için, çocuğunuzun son zamanlardaki ve şimdiki davranışını göz önünde bulundurarak, bu durumu en iyi anlatan seçeneği lütfen işaretleyiniz.

(1) Hemen Hiç (2) Sık Değil (3) Değişken, Genelde Olmaz (4) Değişken, Genelde Olur (5) Sık Sık (6) Hemen Her Zaman

- | | | | | | | |
|--|----------|----------|----------|----------|----------|----------|
| 1. Çocuğum bulmaca çözmek veya yap-boz (lego) gibi bir işe başladığında uzun zaman alsa bile bitirinceye kadar üzerinde çalışır. | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Çocuğum her gün, hemen hemen aynı zamanda bir şeyler atıştırmak ister. | 1 | 2 | 3 | 4 | 5 | 6 |

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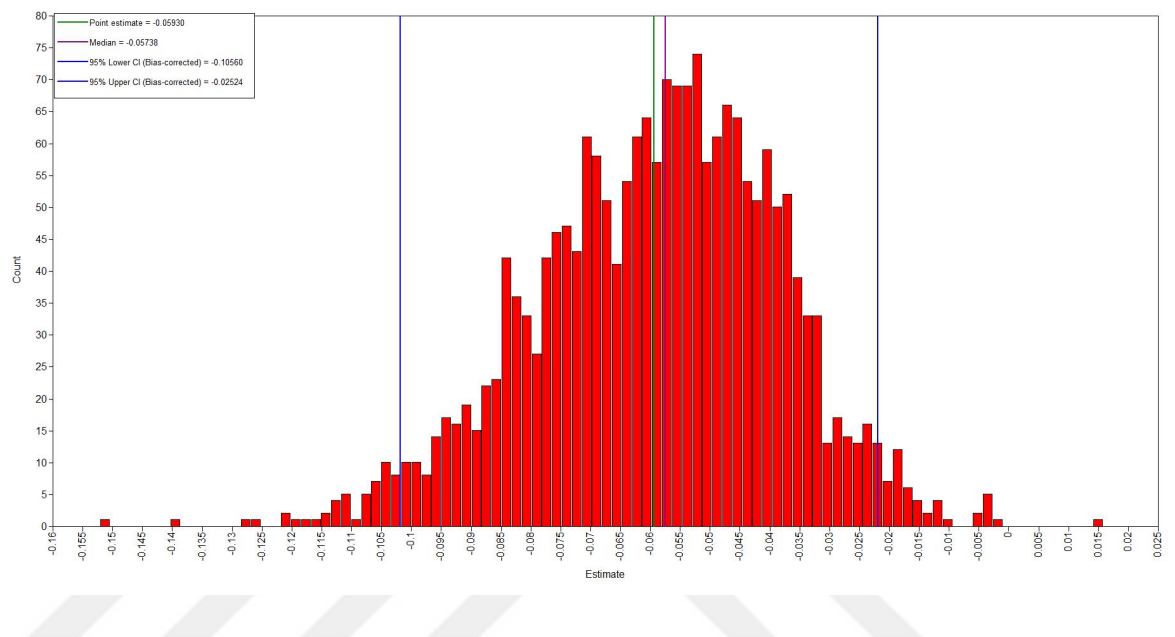
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SUPPLEMENTARY MATERIALS

S1: Bias-corrected 95% credible confidence intervals for indirect path from reactivity to sleep behaviors via consistent bedtime routines



S2: Bias-corrected 95% credible confidence intervals for indirect path from rhythmicity to sleep behaviors via bedtime behavior routines

