



## Original Article

# Mother–father agreement and one-year stability of children's sleep functioning



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## ABSTRACT

**Objectives:** To (1) evaluate mother–father agreement of total sleep problems and specific sleep problem domains and (2) examine the one-year stability of children's sleep functioning, including cross-rater stability.

**Methods:** A community-based sample of 519 children (51% boys) in Spain was assessed in third grade and again 1 year later. At each time-point, both mothers and fathers provided ratings of sleep functioning using the Children's Sleep Habits Questionnaire (CSHQ).

**Results:** Sleep scores did not differ between mothers' and fathers' ratings. Cross-sectionally (at both time-points) and longitudinally (from grade 3 to grade 4), strong agreement was found between mothers' and fathers' ratings of total sleep problems, sleep habits, night wakings, and parasomnias. Lower agreement was found for daytime sleepiness and sleep onset delay. There was large effect size stability for both mothers' and fathers' ratings over the one-year period on the total sleep disturbance scale and most sleep subscales.

**Conclusions:** This study provides the first evidence of strong mother–father agreement on subjective ratings of children's sleep functioning, both concurrently and over a one-year period, for overall sleep problems and certain sleep domains. However, agreement was far from identical, and further studies are needed to evaluate reasons for discrepancy and whether mother–father discrepancy in sleep functioning predicts children's functioning. More studies are needed that systematically include both mothers' and fathers' perspectives regarding children's sleep.

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## 1. Introduction

Sleep is a critical domain of functioning for optimal child health and development [1,2]. As such, sleep is frequently assessed in research protocols, and sleep functioning is also evaluated not only by sleep specialists but also by pediatricians, educators, and mental health professionals [3,4]. Although polysomnography, video-somnography, and actigraphy have notable strengths in providing objective indices of children's sleep functioning, these methods require specialized equipment and technological knowledge and

can also be time-intensive, costly, and burdensome to implement [4]. Given their cost-effectiveness, ease of administration and scoring, and portability (all of which make questionnaires particularly well suited for screening and large-scale clinical/research efforts), subjective sleep questionnaires are the most frequently used methods for assessing sleep in children [4,5]. Sleep questionnaires can also evaluate multiple domains of sleep functioning, including sleep–wake patterns, sleep habits and hygiene, sleep initiation and maintenance, and daytime sleepiness [5]. In sum, subjective sleep questionnaires play a key role in the assessment of children's sleep functioning, yet there is a clear need for more research evaluating these questionnaires for both research and clinical purposes [6].

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### 1.1. Mother–father agreement of children's functioning

Though children are increasingly asked to provide a self-assessment of their own sleep functioning [7,8], parents remain the most frequent respondents of children's sleep functioning [4]. There has been ongoing interest in whether parent-reported sleep functioning relates to polysomnography [9], actigraphy [10,11], clinician-based sleep diagnoses [12], and children's self-ratings of sleep [13,14]. Although the degree of correspondence between parent-reported sleep functioning and these other sleep assessment measures varies, this is at least partly expected, given differences in the sleep assessment measures themselves [4,5] and the well-documented discrepancies between different respondents of children's behavior and functioning [15,16].

Notably, we are unaware of any study that has directly examined mothers' and fathers' agreement of children's sleep functioning. This is a notable gap in the current knowledge base regarding the assessment of sleep in children using subjective sleep questionnaires. Although unexamined in regard to sleep functioning specifically, a large body of research has examined mother–father agreement of children's emotional and behavioral functioning. A consistent finding from these studies is that mothers and fathers, who typically observe the child in the same setting, have stronger correspondence than other cross-informant pairs (eg, parent–child, parent–teacher) [15–17]. Furthermore, it is clear that fathers and mothers have a stronger agreement on children's externalizing functioning domains (eg, aggression, hyperactivity) than on children's internalizing functioning domains (eg, anxiety, depression) [15,16,18,19]. Nevertheless, discrepancies are found between mothers and fathers ratings of child behavior, even in the externalizing domain, with mixed findings as to whether mothers rate children as more symptomatic/problematic than fathers [20] or whether there are no differences in problem severity between mothers' and fathers' ratings [18]. However, no studies have examined these issues in regard to children's sleep functioning specifically, and the need to examine mother–father agreement of children's sleep functioning aligns with the broader need to more regularly include fathers in child development and psychopathology research [21–23]. Sleep functioning is not considered either an externalizing or internalizing domain, and there is ongoing concern that parents may not be able to adequately observe certain sleep functioning domains, including night wakings, sleep onset latency, and sleep quality [8,11,14]. However, it is unknown whether mothers and fathers differ in their ratings on these and other sleep domains, although it is possible that mothers and fathers may differ in their sleep ratings if one parent is more involved in bedtime/waking habits and routines. Mothers are more likely than fathers to be involved in child care generally and bedtime specifically [24,25], and so mothers may be more likely than fathers to observe sleep problems. For example, in the first year of life, mothers endorse stronger beliefs than fathers about responding quickly to infant night wakings [26]. However, mothers' and fathers' involvement in—and perception of—children's sleep functioning may shift across development. Thus, the primary objective of this study was to evaluate whether mothers and fathers differed in ratings across a range of sleep functioning domains and to provide the first direct test of mother–father agreement of children's sleep functioning in middle childhood.

### 1.2. Stability of children's sleep functioning in middle childhood and mother–father agreement

In the present study, we also evaluated the stability of children's sleep over a one-year period from third to fourth grade (ages nine and ten) because we would expect sleep functioning ratings to be at

least somewhat stable during this period [27,28]. For example, Gregory and O'Connor [29] examined the stability of children's sleep from age 4–15 years. The investigators found a decrease in sleep problem severity, as well as only modest stability ( $r = 0.29$ ), across the 11-year period, although the stability between shorter time intervals (eg, age 9–10) was notably higher. In addition, sleep items from the Child Behavior Checklist (CBCL) were used, which has emerging psychometric support [9,12] but is still not considered a well-validated measure of children's sleep functioning and does not assess specific domains of sleep.

One well-validated and frequently used multidimensional measure of children's sleep functioning is the Children's Sleep Habits Questionnaire (CSHQ) [30]. In the initial validation study, acceptable test–retest reliability was established over a two-week period in a sample of 60 parents from a community sample [30]. In a sample of 100 children with pervasive developmental disorders (eg, autism), Honomichl et al. [31] found significant stability across the total sleep disturbance and specific sleep dimensions over a 4-week period ( $r$  values = 0.56–0.84). In a sample of 270 children with attention-deficit/hyperactivity disorder (ADHD; aged 5–13 years at the baseline assessment), Mulraney et al. [32] recently reported strong stability of the CSHQ total sleep disturbance scale over two six-month periods ( $r$  values = 0.84 and 0.77) as well across the full one-year period ( $r = 0.75$ ). The authors did not examine the stability of specific CSHQ subscales. In the present study, we evaluated the one-year stability of the CSHQ total sleep disturbance scale and the CSHQ subscales in a large, normative sample of children.

In addition to examining the one-year stability of sleep functioning within mothers' and fathers' ratings of children's sleep, we also examined the one-year stability across mothers' and fathers' ratings of sleep. That is, is there longitudinal consistency between parental ratings of sleep functioning? This is worthwhile to bolster confidence in the cross-sectional correspondence between mothers' and fathers' sleep ratings. Further, finding strong cross-rater stability of sleep functioning would help alleviate concerns that one-year stability may be attributable to mono-informant biases. Thus, in the present study, we evaluated the within-rater stability of children's sleep functioning and the longitudinal cross-rater effects between mothers' and fathers' sleep ratings.

### 1.3. Study objectives

Using a large community-based sample of children from Spain and a well-validated measure of children's sleep functioning, this study had two objectives:

1. The primary objective of this study was to evaluate the agreement between mothers and fathers of children's sleep functioning, including overall sleep problems and specific domains of sleep functioning.
2. The secondary objective was to examine the one-year stability of children's sleep functioning, with a particular interest in whether stability varied across sleep domains examined or rater.

## 2. Methods

### 2.1. Participants and procedures

The participants were the mothers and fathers of 519 third- and fourth-grade Spanish children (51% boys). On the island of Majorca in the Balearic Islands (Spain), the population of 46 elementary schools was invited to participate in the study, with 43 schools indicating an interest. Twenty-two of these 43 schools were then randomly selected to participate in the study, and all 22 schools

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