



Original Article

The French Sleep Disturbance Scale for Children



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ABSTRACT

Objective: The psychometric properties of the Sleep Disturbance Scale for Children (SDSC) have been shown to be accurate, even when translated into several languages. The aim of the present study was to translate, adapt, and validate the SDSC for a French-speaking population.

Methods: After forward- and back-translation, the tool was further translated and adapted into the French language. It was then pretested in terms of clarity on 33 French-speaking parents. Pretesting demonstrated that the questionnaire was well understood, indicating good clarity. During the validation phase, a total of 447 French-speaking parents of children aged between 4 and 16 years completed the SDSC. Among these, 66 children were diagnosed with sleep disorders by a pediatric specialist after a sleep consultation and polysomnographic recordings.

Results: The factor analysis revealed five factors: difficulty in initiating and maintaining sleep (DIMS), sleep breathing disorders (SBD), disorders of excessive somnolence (DOES), parasomnias (PARA) and non-restorative sleep (NRS). This psychometric structure is reliable and logical in comparison with the experts' diagnoses. Convergent validity, divergent and internal reliability are very good. Inter-parental concordance in scoring the child's sleep problem does show differences in the ways in which parents report their children's sleep patterns. Cut-off was calculated for the total score (45).

Conclusion: This study validated a 25-item French version of the questionnaire. The French SDSC could therefore be used to aid screening of sleep disorders in the general population.

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1. Introduction

Sleep disturbances in children are very common. The prevalence of sleep-related problems is estimated to be between 35 and 46% [1,2]. Sleep disturbances are a major cause for pediatric consultation [3] which unfortunately often results in erratic treatment of

young patients [4]. The consequences of sleep disturbances impact various areas of life [5] including learning [6], mood swings [7,8], health [9], and risk of obesity [10–15]. Sleep disorders are associated with inattention, mood variability, and limit-setting and rule-breaking behaviors [16]. Poor sleep is related to maladaptive social skills [17]. Some studies show that, if left untreated, sleep disturbances in childhood can persist with age [18–20]. Some sleep disturbances in children are chronic, others temporary, but even in temporary disturbances, long-term effects on the whole family can be observed [21], such as parental insomnia [22], marital problems [23], and depression [24].

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Despite their high prevalence, sleep disturbances are underdiagnosed in France [25]. While there are more than 57 scales and questionnaires currently being used to assess sleep and associated pathologies in children and adolescents [26,27]. Recently two reviews were published on pediatric sleep questionnaires; ie, questionnaires focusing on sleep problems in adolescents and questionnaires focusing on sleep times in children and adolescents [28,29]. To the best of our knowledge, none have yet been validated for a French-speaking population.

The Sleep Disturbance Scale for Children (SDSC) [30] has been reported to have good psychometric properties in studies undertaken worldwide (high internal consistency of 0.79 in controls and 0.71 in clinical groups, adequate test/retest reliability of $r = 0.71$ for total and single-item scores, and this across countries and hence languages) [31–34]. The 26 sleep complaints are scored by the caregiver on a five-point Likert scale investigating the complaint during the previous six months. The tool is provided at no cost and the average time taken to complete it is approximately 10 min. The items describe typical symptoms and behaviors relating to each of the most common sleep disorders among children. Indeed, Bruni's study, using non-clinical and clinical participants, demonstrates six significant factors, which represent the most common sleep disturbances in children and adolescents: disorders of initiating and maintaining sleep (DIMS), sleep-disordered breathing disorders (SDB), disorders of arousal (DA), sleep–wake transition disorders (SWTD), disorders of excessive somnolence (DOES), and sleep hyperhydrosis (SHY). The factors more closely resemble those of the Association of Sleep Disorders Centers classification (ASDC) [35] than the International Classification of Sleep Disorders categories (ICDS) [36], as these are better adapted to childhood disorders and more clinical in nature. The SDSC was developed for 6.5- to 15.3-year-old children, and recently also a version for 3- to 6-year-olds has been made available [37]. The SDSC for preschoolers assesses six types of sleep disorder: parasomnias (PARA), DIMS, SBD, DES, SH, and non-restorative sleep (NRS). Considering factor analysis differences, we decided to compare the French version of the SDSC to the newer categories of the ICSD-3 [38] which have six major categories: insomnia, sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm sleep–wake disorders, parasomnias and sleep-related movement disorders. This article describes the translation, adaptation and validation of the French version of the original SDSC for children aged 4–16 years old.

2. Method

The present study was carried out in three main phases (Table 1): (1) English–French forward- and back-translation of the SDSC and accompanying translation for better adaptation in French culture, (2) pretesting the comprehension of items in a sample of 33 parents, (3) psychometric validation of the French SDSC in 447 French children aged between 4 and 16 years, 381 children whose parents have never asked for a sleep consultation (control group), and 66 children diagnosed with a sleep disorder by a pediatrician specialized in sleep disturbances (clinical group). All parents signed a parental consent form. The study was previously approved by the Lyon Bérard Committee for the Protection of People (CPP).

2.1. Participants

2.1.1. Second phase: pretesting of the French SDSC

In pretesting, participants were 33 French-speaking parents (11 fathers and 22 mothers), students in Psychology.

Table 1

Distribution of all children who participated in the three phases of the study.

		N = 480 French-speaking children	
	Pretesting group (N = 33)	Clinical group Children in sleep consultation (N = 66)	Control group Children in school (N = 381)
Phase 1: translation and back-translation		Panel of sleep experts discussed the translated version	
Phase 2: pilot testing the comprehension	33		
Phase 3: psychometric analysis			
Validity			
Construct validity		66	381
Concurrent and divergent validity with diagnostics		66	
Concurrent and divergent validity with rhythm factors			381
Convergent validity		66	381
Reliability			
Internal reliability		66	381
Concordance between father and mother		36	
Diagnostic validity			
Distribution		66	381
Cut-off		66	381

2.1.2. Third phase: psychometric validation of the French SDSC

The French SDSC questionnaire was sent to 540 parents, either parents whose children attended schools which were partners in the study (control group), or parents having requested a pediatric sleep consultation in the pediatrics unit of the Mother–Child Hospital in Bron (Hopital Femme Mère Enfant, HFME) (clinical group). The SDSC was accompanied by an explanatory covering letter, a parental consent form, and sleep schedule questions. The child's sleep patterns were recorded: bedtime, wake-up time, nap time, and any changes in pattern between schooldays and weekends were obtained from parents. When returned, the questionnaires were checked to ensure that they were fully completed. Of the 540 questionnaires sent out, 93 questionnaires were not fully completed, and were thus excluded from the study. The remaining 447 questionnaires completed by parents of French-speaking children were used to test the psychometric properties of the French SDSC. These included 381 questionnaires of children whose parents have never requested a sleep consultation for their child (control group) and 66 questionnaires of children who were later seen in sleep consultation and subsequently diagnosed with sleep disorders by specialized sleep pediatricians (clinical group).

In the control group, all children were assessed by one parent. In the clinical group, 30 children were assessed by one parent and 36 were assessed by both parents. Parents of children of the clinical group completed the SDSC prior to the sleep consultation.

Control group: the control group sample came from children participating in a study on 'Acquisition of normative behavioral data' in a population of healthy children in schools in the Academy of Rhone (France).

Clinical group: the patients had an initial consultation with four certified sleep specialists (PF, AGP, AR, DW) who were also responsible for their treatment. Diagnostic procedures were based on sleep disorders according to the third edition of the International Classification of Sleep Disorders [39]. For insomnia, parasomnias, and circadian rhythm sleep–wake disorders,

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