



Allergologia et immunopathologia

Sociedad Española de Inmunología Clínica,
Alergología y Asma Pediátrica

www.elsevier.es/ai



ORIGINAL ARTICLE

Validation of the Children's Sleep Habits Questionnaire in a sample of Greek children with allergic rhinitis[☆]

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Received 19 August 2017; accepted 14 September 2017

KEYWORDS

Allergy;
Allergic rhinitis;
Sleep;
Sleep quality;
Validation study

Abstract

Background: Obstructive respiratory disorders, such as allergic rhinitis and asthma may impair sleep quality. The aim of this study is to validate the Children's Sleep Habits Questionnaire (CSHQ) for Greek children from 6 to 14 years of age. No validated tool has been developed so far to assess sleep disturbances in Greek school-aged children.

Methods: We examined the reliability and validity of the CSHQ in a sample of children with allergic rhinitis (AR) and a non-clinical population of parents of these children as a proxy measure of children's AR quality of life (QoL) as evaluated by the Pediatric Allergic Rhinitis Quality of Life (PedARQoL) questionnaire.

Results: The CSHQ questionnaire Child's Form (CF) had a moderate internal consistency with a Cronbach's alpha 0.671 and Guttman split-half coefficient of 0.563 when correlated with the PedARQoL (CF). There was also a moderate intraclass correlation of ICC = 0.505 between the responses to both questionnaires in the two visits. The CSHQ Parent's Form (PF) had a very good internal consistency with a Cronbach's alpha of 0.928 and Guttman split-half coefficient of 0.798. There was a high intraclass correlation of 0.643 between the responses in the two visits.

Abbreviations: CSHQ, Children's Sleep Habits Questionnaire; AR, allergic rhinitis; QoL, quality of life; PedARQoL, Pediatric Allergic Rhinitis Quality of Life; CF, Child's Form; PF, Parent's Form; V1, Visit 1; V2, Visit 2.

[☆] **Registration No:** No clinical registration number is provided for this clinical trial as no experimental pharmaceutical agents have been used. The study was conducted by means of questionnaires and the treatment followed is a well-established conventional treatment for allergic rhinitis.

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<https://doi.org/10.1016/j.aller.2017.09.016>

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Please cite this article in press as: Mavroudi A, et al. Validation of the Children's Sleep Habits Questionnaire in a sample of Greek children with allergic rhinitis. Allergol Immunopathol (Madr). 2018. <https://doi.org/10.1016/j.aller.2017.09.016>

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Conclusions: The Greek version of the CSHQ CF, but particularly the PF has proved to be a very reliable clinical instrument, which can be used in clinical trials for assessing sleep quality in school-aged children with sleep disturbances because of obstructive airway disorders, such as AR.

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Introduction

Chronic respiratory diseases, such as allergic rhinitis and asthma may impair sleep quality. A common complaint of patients who suffer from rhinitis is impaired daytime performance (including daytime sleepiness) often attributed to impaired sleep. Poor sleep related to allergic rhinitis is not clearly understood but may be in part attributed to nasal congestion.¹ Allergic rhinitis (AR) represents a risk factor for snoring in children.^{2,3} Sleep disturbances and sleep loss may be a result of poorly controlled symptoms. As a result, daytime fatigue leads to decreased overall cognitive function.^{4,5} Despite a normal night's sleep, fatigue in awakening has a prevalence of 43.7% among allergic rhinitis patients as reported by Leger et al.⁶ In patients with asthma, the coexistence of perennial non-infectious rhinitis has been shown to be an important risk factor for daytime sleepiness, for difficulty in maintaining sleep and early morning awakening.⁷ The aim of this study was to examine the reliability and validity of the Children's Sleep Habits Questionnaire (CSHQ)⁸ in a sample of 112 children suffering from AR and a non-clinical population of parents of these children as a proxy measure of children's AR quality of life (QoL) evaluated by the Pediatric Allergic Rhinitis Quality of Life (PedARQoL) Questionnaire.⁹

Methods

Ethical approval for the clinical study was provided by the Ethics Committee of the Aristotle University of Thessaloniki, Greece. The study was undertaken in the Paediatric Allergy Unit at the Aristotle University of Thessaloniki. All participants gave informed consent to take part. Both patients and patients' parents preserved their anonymity when answering the questions.

Patient and parent sample

The patient sample consisted of one hundred and twelve children in total (75 boys and 37 girls) with a mean age 10.36 ± 2.25 years (range 6–14 yrs). All the participating patients had to meet the inclusion criteria, which were a clinical diagnosis of persistent AR, i.e. having symptoms more than four days per week and for more than four weeks. The patients were ascertained sensitive to a variety of aeroallergens, such as house dust mite (*Dermatophagoides pteronyssinus* and *Dermatophagoides farinae*), grass pollen (Timothy grass, Rye grass, *Cynodon dactylon*, Meadow fescue), tree pollen (*Pinus silvestris*, Olive, Cypressus,

Platanus), mould (*Aspergillus fumigatus*, *Alternaria alternata*) and weed pollen (*Parietaria judaica*, *Parietaria officinalis*, *Ambrosia artemisiifolia*). The diagnosis of AR was based on personal and family medical history, physical examination and positive skin tests to one or more of the previously mentioned aeroallergens. The coexistence of asthma was not an exclusion criterion if the patients had achieved a good control of asthma symptoms in the previous six months. The non-clinical sample were the parents of the participating children with diagnosed AR.⁹

Materials

The Parent's Form (PF) of the Children's Sleep Habits Questionnaire (CSHQ) is a retrospective 45-item questionnaire designed for school-aged children between four and 10 years of age and has been used in several studies to detect sleep behavioural disorders in young children.^{10–12} The 45 questions were categorised into seven subclasses reflecting the following sleep related disorders: (1) Sleep Onset Delay, (2) Sleep Duration, (3) Bedtime Resistance, (4) Sleep Anxiety, (5) Parasomnias, (6) Night Wakings, (7) Daytime Sleepiness. Children's parents were asked to report sleep disorders which occurred over a "common" recent week. The answers were scored on a three-point scale: "rarely" for a sleep behaviour, which happens from zero to once a week, "sometimes" for two to four times a week and "usually" for a sleep behaviour occurring five to seven times a week.

The Child's Sleep Habit Questionnaire Child's Form (CF) has 26 questions, which are categorised into the following three subclasses: (1) Sleep Duration and Anxiety, (2) Sleep Onset Delay and Bedtime Resistance, (3) Daytime Sleepiness. The answers were scored similarly to the CSHQ (PF).

The Pediatric Allergic Rhinitis Quality of Life Questionnaire (PedARhQoL) Child's Form (CF) consists of 20 questions, which were categorised into five health domains, i.e. AR symptoms, symptom duration, emotions, sleep quality and various aspects associated with the experience regarding the management and the life burden related to AR. Answers were scored on a four-point scale (frequently=3, sometimes=2, rarely=1, never=0). Children were asked how much they had been distressed by the AR symptoms and they were also asked to assign symptom duration (a) < than 4 h: 3, (b) between 1 and 4 h: 2, (c) < than an hour: 1, (d) none: 0. Based on the validation study of the PedARQoL patient's answers yielded a score ranging from 20 to 80 with the lower scores indicating a better QoL.⁹

Children's parents were asked to complete the PedARhQoL Parent Form (PF). Questions addressed to

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