

## Development and validation of the “Sleep Hygiene for Children” booklet

Elaboração e validação da cartilha “Higiene do Sono para Crianças”  
Elaboración y validación de la cartilla “Higiene del sueño para niños”

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**Abstract**

**Objective:** To develop and validate a booklet on sleep hygiene for school children.

**Methods:** Methodological study conducted from September 2018 to October 2019, following the steps of bibliographic survey, development and content validation of the booklet by experts. The instrument for validation, sent to three health professionals, was composed of seven items, divided into sub-items with responses arranged on a Likert-type scale. Data obtained were tabulated in an Excel spreadsheet. Values of the proportion of agreement of sub-items between experts (content validity index) above 80% were considered appropriate.

**Results:** The booklet was validated after the second evaluation round, reaching a validity rate of 85.7% of the total content. It comprised the following four themes: “What is sleep hygiene?”, “Importance of sleep”, “How to practice sleep hygiene?” and “Sleep hygiene recommendations quick guide”.

**Conclusion:** The sleep hygiene booklet for children, validated by experts in the second round, can help children understand the importance of sleep for their development and obtain appropriate sleep and self-care habits.

**Resumo**

**Objetivo:** Elaborar e validar cartilha sobre higiene do sono para crianças escolares.

**Métodos:** Estudo de abordagem metodológica, realizado no período de setembro de 2018 a outubro de 2019, seguindo as etapas de levantamento bibliográfico, elaboração e validação de conteúdo da cartilha por especialistas. O instrumento para validação, encaminhado a três profissionais da área da saúde, foi composto por sete itens, divididos em subitens, com respostas dispostas em escala tipo Likert. Os dados obtidos foram tabulados em planilha do Excel. Considerou-se adequado os valores da proporção de concordância dos subitens entre os examinadores (índice de validade do conteúdo) acima de 80%.

**Resultados:** A cartilha foi validada após a segunda rodada de avaliação, atingindo índice de validade de 85,7% do conteúdo total e sendo composta por quatro temas: “O que é higiene do sono?”, “Importância do sono”, “Como realizar a higiene do sono?” e “Guia rápido de recomendações de higiene do sono”.

**Conclusão:** A cartilha de higiene do sono para crianças, validada por especialistas na segunda rodada, poderá auxiliar a criança a entender a importância do sono para seu desenvolvimento e obter hábitos adequados de sono e de autocuidado.

**Resumen**

**Objetivo:** Elaborar y validar una cartilla sobre higiene del sueño para niños escolares.

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**Conflicts of interest:** Although Avelar AFM is an associate editor of Acta Paulista de Enfermagem, she did not participate in the manuscript evaluation process, nor in decisions that resulted in the acceptance of the article.

**Métodos:** Estudio de enfoque metodológico, realizado en el período de septiembre de 2018 a octubre de 2019, que siguió las etapas de recopilación bibliográfica, elaboración y validación del contenido de la cartilla por especialistas. El instrumento para la validación, que fue enviado a tres profesionales del área de la salud, estaba compuesto por siete ítems, divididos en subítems, con respuestas dispuestas en escala tipo Likert. Los datos obtenidos fueron tabulados en planilla de Excel. Los valores de la proporción de concordancia de los subítems entre los examinadores (índice de validez de contenido) superiores a 80 % se consideraron adecuados.

**Resultados:** La cartilla fue validada después de la segunda ronda de evaluación, con un índice de validez del contenido total del 85,7 %. El material está compuesto por cuatro temas: “¿Qué es la higiene del sueño?”, “Importancia del sueño”, “¿Cómo realizar la higiene del sueño?” y “Guía rápida de recomendaciones de higiene del sueño”.

**Conclusión:** La cartilla de higiene del sueño para niños, validada por especialistas en la segunda ronda, podrá ayudar a los niños a entender la importancia del sueño para el desarrollo y a obtener hábitos adecuados de sueño y de autocuidado.

## Introduction

Children’s sleep is extremely important for a healthy development, as it is related to growth, learning and the body functioning.<sup>(1,2)</sup> When children do not sleep properly, there may be harm to school performance, emotional and behavioral problems, decreased cognitive function and other health disorders that can result in lower quality of life and wellbeing, in addition to the risk of developing psychiatric illnesses in adolescence or adulthood.<sup>(3,4)</sup>

Sleep time and quality depend on genetic, physiological, environmental factors and sleep habits, defined as culturally learned behaviors adopted by the individual or caregiver.<sup>(2,5)</sup>

In the preliminary result of a study conducted with school-age children at home aimed at measuring the total sleep time using the actimeter for 15 consecutive nights, it was found that children slept about eight hours a day, that is, less than the nine hours a day recommended by the literature for this age group.<sup>(6,7)</sup> Currently, there is a certain difficulty in providing adequate sleep for children because of habits such as overuse of electronics and the established time for the start of classes in the morning period.<sup>(8,9)</sup>

In order to develop healthy habits to promote children’s sleep, the literature recommends the use of sleep hygiene, which characterizes a set of recommendations aimed at changes in the behavior, daily activities and the environment.<sup>(10)</sup> Studies that evaluated children’s sleep showed more favorable results in terms of quality and quantity after the implementation of certain interventions.<sup>(11,12)</sup>

Awareness of the importance of promoting sleep hygiene can be raised from health education that prepares the individual for self-care and harm re-

duction and is performed by health professionals in any place of practice, such as schools, basic health centers or hospitals. In this context, nurses at school also play a fundamental role in health actions with the function of preventing, maintaining and restoring health.<sup>(13)</sup>

In general, a widely used alternative in health education is the adoption of educational printed materials that facilitate understanding, increase adherence to the theme and favor the adoption of healthier habits, especially in the case of children’s population.<sup>(14)</sup> Considering the importance of sleep for child development and the development of educational material aimed at children, the aim of this study was to develop and validate a booklet on sleep hygiene for school children in order to contribute to the acquisition of more appropriate habits for the promotion of infant sleep.

## Methods

Methodological study focused on the development and evaluation of a technology. It was developed between September 2018 and October 2019 in the following steps: bibliographic survey, development and content validation of the booklet by experts.<sup>(15)</sup>

### Bibliographic survey

The booklet was developed based on a bibliographic survey carried out between September 2018 and May 2019 on Scielo and Pubmed databases using Health Sciences Descriptors/Medical Subject Headings (DeSC/MeSH): “Teaching Materials”, “Sleep Hygiene” and “School Health Service” in English and Portuguese, associated or not with the Boolean operator AND, delimiting the publication

period from 2010 to 2018. Because of the scarcity of materials developed for use in schools and to expand the survey, content on the theme was searched on websites of hospitals, general and/or children's clinical centers, and sleep study associations from the United States of America, Australia, Portugal, England and Brazil.<sup>(3,16,17)</sup>

### Development

The booklet was developed using the Microsoft Office Powerpoint®, version 2019 (16.0.12827.20200) 32 bits, containing information obtained from the identified content and figures prepared by the main researcher, customized by a digital game designer in the PicsArt Photo and Video Editor application, version 15.0 (free application available for Android and IOS) in order to make the material more attractive to the target audience.

### Content validation

After preparing the booklet, evaluators were selected through a search by "Subject" on the Lattes Platform ([www.lattes.cnpq.br](http://www.lattes.cnpq.br)) with the term "sleep" on the database of PhDs and other researchers. Five professionals were randomly selected and contacted by invitation email, which contained the proposed booklet, the informed consent form and the instrument for content validation. An odd number of experts was considered to avoid a tie in opinions during the validation process.

Feedback from three professionals (a nurse, a biomedical and a physiotherapist) was obtained. All had published works on the subject and held a master and/or PhD title.

For the evaluation of the booklet content, a data collection instrument was prepared<sup>(18)</sup> and organized into seven items divided into sub-items, so that the evaluator selected a single response on a Likert-type scale according to his/her opinion on the sub-item: SD - Strongly disagree, D - Disagree, A - Agree, SA - Strongly agree and DN - I don't know. In addition, there was a field for "Suggestions" after each item.

In order to achieve the objective of content validation of the booklet, the instrument was composed of: 1. Content (1.1 The content is scientific

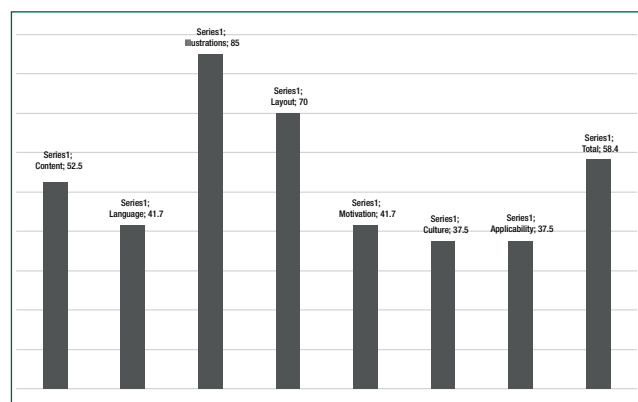
ically correct; 1.2 The content is appropriate for the target audience; 1.3 The content is sufficient to meet the target audience needs; 1.4 The text is in logical sequence; 1.5 The content presentation favors the learning of the theme); 2. Language (2.1 The writing style is compatible with the target audience - 6-10 year old children); 2.2. The writing used is attractive; 2.3 The text language is clear and objective.); 3. Illustrations (3.1 Illustrations are relevant to the content of material and elucidate the content; 3.2 Illustrations are clear and convey ease of understanding; 3.3 The illustrations have graphic quality; 3.4 The number of illustrations is appropriate for the educational material content; 3.5 The presence of each of the pictures in the booklet is relevant); 4. Layout (4.1 The font used makes reading easier; 4.2 The visual composition is attractive and well organized; 4.3 The format/size of the educational material and number of pages are appropriate for the age group.; 4.4 The layout of the text is appropriate); 5. Motivation (5.1 The content is motivating and encourages reading further; 5.2 The content may arouse the interest of the reading child; 5.3 The content may answer questions, clarify and educate the child about sleep hygiene); 6. Culture (6.1 The text is compatible with the target audience, given the different profiles of users; 6.2 The booklet is indicated for use as an educational resource in sleep hygiene); and 7. Applicability (7.1 The booklet has practical applicability for use with 6-10 year old children).

The results were tabulated in a Microsoft Office Excel® spreadsheet, version 2019 (16.0.12827.20200) 32 bits and presented using descriptive statistics. The proportion of agreement between examiners' answers for each sub-item of the evaluation instrument was calculated by the content validity index (CVI) expressed by the ratio between the number of sub-items scored as "strongly agree" or "agree" and the total number of evaluations performed. The CVI was measured for each item of the instrument (partial CVI) and for the instrument as a whole (total CVI), and values above 80% were considered as appropriate and content was validated when the total CVI was equal to or greater than 80%.<sup>(19)</sup>

Ethical-legal procedures were followed to begin the study that was approved by the Research Ethics Committee of the Universidade Federal de São Paulo under number 0370/2018.

## Results

The booklet was prepared based on the full reading of 23 articles and six publications of sleep associations, comprising the most cited and appropriate sleep hygiene recommendations for the school-age group. Three judges, two with a master’s degree and one with a PhD degree, participated in the first round of content validation. They evaluated the first version of the booklet through the validation questionnaire. The first version of the booklet was divided into: “Pages 1 to 4 - Introduction to sleep hygiene”, “Pages 5 to 7 - Importance of sleep”, “Page 8 - When should we sleep?” and “Pages 9 to 14 - How to practice sleep hygiene?”. A total CVI of 58.4% was obtained, therefore, below the value stipulated for validation. Figure 1 shows the partial CVI for each item of the instrument and the total CVI in the first evaluation round.

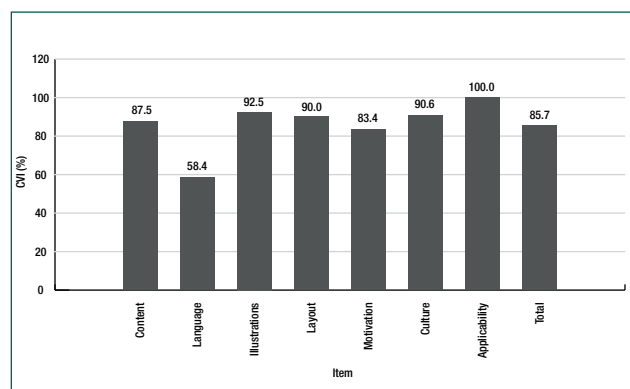


**Figure 1.** Partial and total content validity index (CVI) in the first round

The experts’ suggestions mainly covered the item “Language” with an indication for replacing technical terms with more usual words in order to make it more understandable for children. The inclusion of a list to favor children’s quick access to sleep hygiene recommendations was also suggested.

Thus, following the experts’ suggestions, the themes were reorganized, the initial presentation of the content was more succinct, the terms used for sleep hygiene recommendations were simplified and better developed for the understanding of the target audience, and finally the quick recommendations guide was included.

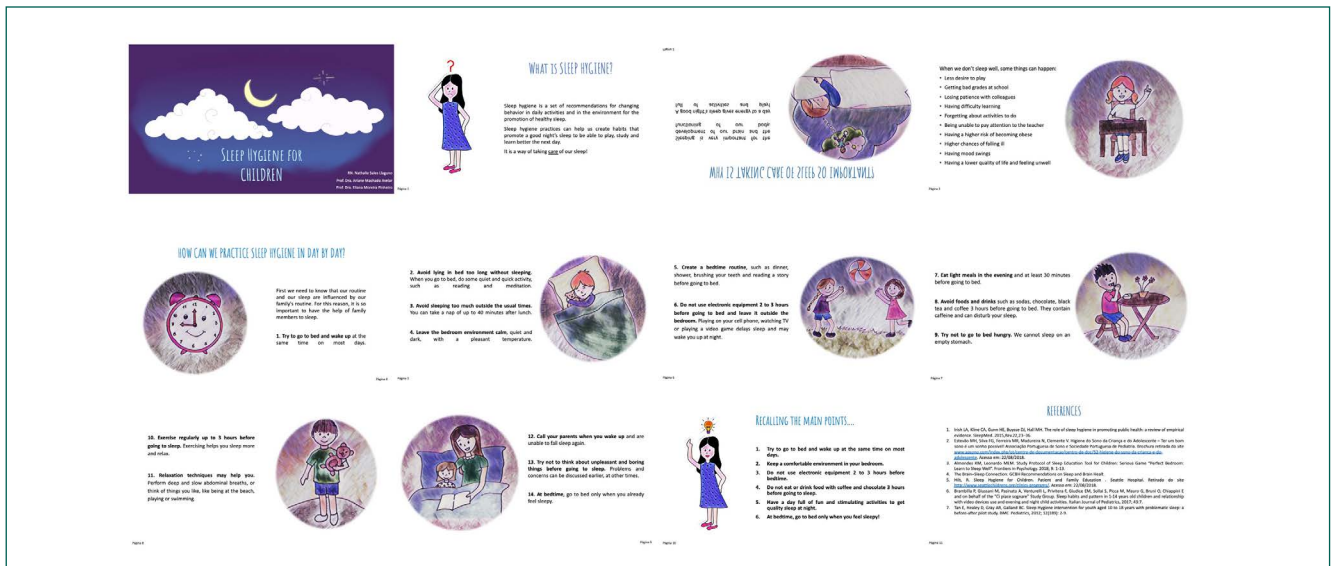
The second version of the booklet sent to the same three judges was divided into: “Page 1– What is sleep hygiene?”, “Pages 2 to 3 - Why is taking care of sleep so important?”, “Pages 4 to 9 - How can we practice sleep hygiene in day by day?” and “Page 10 - Recalling the main points...”. Figure 2 shows the partial CVI for each item of the instrument and the total CVI (85.7%) in the second round of evaluation by judges. The item “Language” did not reach the minimum percentage because of sub-item ‘2.2. The writing used is attractive’, but the evaluation of the other items reached the total CVI above the stipulated.



**Figure 2.** Partial and total content validity index (CVI) in the second round

The content of the booklet was separated into themes by pages, arranged in paragraphs or in topics with simple words, including only the information necessary for children’s understanding. Initially, focusing on children’s understanding of the importance of sleep and then, on measures to promote appropriate sleep.

The illustrations were designed to relate to the writing of each page and attract children’s attention with a colorful design. The Erstwhile DEMO font,



**Figure 3.** Final version of the booklet “Sleep Hygiene for Children”

sizes 50 to 60 were used for titles and the Confortaa font, size 20 for texts.

The booklet was called “Sleep Hygiene for Children” and consisted of a cover, 11 illustrated pages and four themes (Figure 3).

## Discussion

In the process of development and content validation of the booklet offering guidance on healthy habits for promoting sleep among school age children, there was a scarcity of studies presenting robust recommendations to this age group. In addition, the booklet was not evaluated by schoolchildren and the content of the material was evaluated by a small number of judges, even though they had broad experience in the subject.

When health education is inserted into the school environment by nurses, it can be a health promotion tool and enable the insertion of healthy habits and quality of life.<sup>(20)</sup> Printed materials in the form of booklets, folders, pamphlets or brochures are used in health education with the aim to disseminate information considered important for the prevention or treatment of illnesses, and enable interaction between professionals and the population.<sup>(21)</sup> It is essential that the material is written in accessible language, is attractive, objective and succinct

and provides significant guidance on the topic, hence the importance of illustrating the guidelines for relaxing, encouraging reading, making it more attractive and facilitating understanding.<sup>(21,22)</sup>

Thus, the booklet with illustrations is an accessible way to guide children about the importance of sleep and that adopting measures can help them to get appropriate sleep. As school-age children are the target audience of the material, the presentation of the booklet with specific characteristics gains even more importance as, in order to arouse readers’ interest and influence their habits positively, it must bring playfulness in a fun, attractive experience.<sup>(23,24)</sup>

For the content validation of the booklet, the literature describes the need for experts’ considerations on the topic, because, in addition to obtaining an accurate multidisciplinary opinion, the suggestions refine the material and make it official.<sup>(25)</sup> Authors who developed educational materials and performed their content validation, used the content validity index (CVI) to determine the consensus among experts and adopted an agreement index equal to or greater than 75%.<sup>(26,27)</sup>

After obtaining a total CVI of 85.7%, started the assessment of experts’ considerations and suggestions that were fully accepted to improve the writing of the final version of the booklet. It is noteworthy that, through suggestions, this booklet was developed by observing children’s individual dif-

ferences according to chronotypes that predispose them to preferred times to sleep and wake up and phases of greater physical and cognitive disposition, respecting the individual perception of circadian rhythms and external synchronizers in humans.<sup>(28)</sup>

Educational materials on sleep hygiene aimed specifically at children are scarce in the literature. The target audience of materials available at universities, hospitals and clinics are the adults responsible for the children and emphasize aspects related to sleep in different age groups, address associated diseases, the creation of healthy habits and routines, and preparing the environment for sleep.<sup>(29-31)</sup>

Thus, the aim of this booklet is to offer children an understanding of what sleep hygiene is about and why taking care of sleep is so important, without the need of help from an adult, thereby constituting one of the bases of health education, which is to train individuals with knowledge, motivation and competence to understand, evaluate and apply health information, strengthening their self-care and making them capable of transforming their reality.<sup>(32,33)</sup>

Participation of the family in children’s education is fundamental, with emphasis on their active participation in the learning process in order to begin to introject the importance of children’s actions in the context of self-care in all phases of the life cycle so that certain routines can be performed autonomously and transformed into habits for a healthy life.

## Conclusion

The sleep hygiene booklet developed from the identification of bad habits in promoting sleep among schoolchildren was developed and validated by experts in the second round. It is composed of four themes and a guide of recommendations for the adoption of healthy habits to promote sleep, and can help children to obtain adequate sleep habits, self-care, and understand the importance of sleep for their development. Among the implications for practice, the aim of the booklet is to support nurses’ care actions in the school environment, and may

favor children’s autonomy for sleep care and their performance as multipliers of this knowledge in their family.

## Collaborations

Llaguno NS, Pinheiro EM and Avelar AFM contributed to the project design, analysis and interpretation of data, writing of the article, relevant critical review of the intellectual content and final approval of the version to be published.

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