

# Health Promotion in Obstructive Sleep Apnea Syndrome

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## Abstract

### Keywords

- ▶ health education
- ▶ sleep apnea
- ▶ obstructive
- ▶ sleep disorders
- ▶ speech
- ▶ language and hearing sciences

**Introduction** Obstructive sleep apnea syndrome (OSAS), which is commonly underdiagnosed, has a high occurrence in the world population. Health education concerning sleep disorders and OSAS should be implemented.

**Objectives** The objective was to identify studies related to preventive actions on sleep disorders, with emphasis on OSAS.

**Data Synthesis** A literature review was conducted using Lilacs, Medline, PubMed, and Scopus by combining the following keywords: “Health Promotion,” “Sleep Disorders,” “Primary Prevention,” “Health Education,” and “Obstructive Sleep Apnea Syndromes.” Initially, 1,055 papers, from 1968 to 2013, were located, with the majority from the Scopus database. The inclusion criteria were applied, and four articles published between 2006 and 2012 were included in the present study.

**Conclusions** The studies on preventive actions in sleep disorders, with emphasis on OSAS, involved the general population and professionals and students in the health field and led to increased knowledge on sleep disorders and more appropriate practices.

## Introduction

Sleep disorders are characterized by alterations in sleep that affect the quality of life and the execution of the individual's daily activities.<sup>1</sup> Such disorders include sleeplessness, nocturnal bruxism, narcolepsy, somniloquy, nocturnal enuresis, parasomnias, night terror, restless legs syndrome, sleepwalking, and obstructive sleep apnea syndrome (OSAS).<sup>2,3</sup>

OSAS has demonstrated increased occurrence in the worldwide population. Studies on the prevalence of OSAS have been performed in several places of the world, considering child and adult populations, although without standardization of methods or procedures. In children, OSAS prevalence was found to be between 0.8 and 2.8%<sup>4</sup>; however, the prevalence was higher in oral breathing and obese children.<sup>5–7</sup> In the adult population, a prevalence of 2 to 26% was observed,<sup>8–13</sup> increasing from 39 to 71% in obese adults.<sup>14</sup>

In Brazil, only one study on the prevalence of OSAS used polysomnography, considered the highest standard for the diagnosis of such condition. The sample of 1,042 volunteers, aged 20 to 80 years, resulted in 32.8% of the participants diagnosed with OSAS. This study presents findings of higher OSAS prevalence as compared with the above-mentioned studies.<sup>15</sup>

Besides the OSAS effect during sleep (i.e., intermittent hypoxemia, transient hypercapnia, and frequent waking),<sup>16</sup> other implications such as attention deficit in the learning process and in auditory memory and alteration of the tonicity of orofacial myofunctional muscles may be observed.<sup>17–20</sup> It is worth mentioning the consequences affecting the population, such as decreased job productivity and increased work and traffic accidents.<sup>21–23</sup>

Studies demonstrated low rates of OSAS diagnosis,<sup>24</sup> noting that 95% of the individuals were not identified due to the lack of general knowledge and specific knowledge on sleep

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disorders by health care professionals.<sup>25-31</sup> Thus, health education is needed for the identification of OSAS symptoms directed to the general population, as well as to health care professionals, aiming at better diagnosis and earlier detection through specific protocols.

Therefore, the purpose of the present work was to identify studies involving preventive health care to sleep disorders, with emphasis on OSAS.

**Review of Literature**

The literature review was done by searching the databases Lilacs, Medline, PubMed, and Scopus, using the following DeCS/MeSH keywords: (1) "Sleep Disorders"; (2) "Sleep Apnea Syndromes"; (3) "Health Promotion"; (4) "Health Education"; (5) "Primary Prevention." Their respective terms in Portuguese were also used for the database Lilacs.

Six matches of two keywords were used each time in all the databases selected. The keywords were separated by the word "AND" in blank search. The combinations were: 1, 3 (combination 1); 1, 4 (combination 2); 1, 5 (combination 3); 2, 3 (combination 4); 2, 4 (combination 5); and 2, 5 (combination 6).

The following inclusion criteria were elected: specific studies concerning preventive actions for health promotion on sleep disorders; emphasis on OSAS; maximum amount of information to people about such clinical condition. Studies about health promotion on sleep disorders were included because general information implies favorable attitudes regarding the quality of sleep, such as sleep hygiene, which is a way of preventing OSAS. The exclusion criteria involved literature review and the approach of only the diagnostic evaluation/treatment of subjects with OSAS or other sleep disorders.

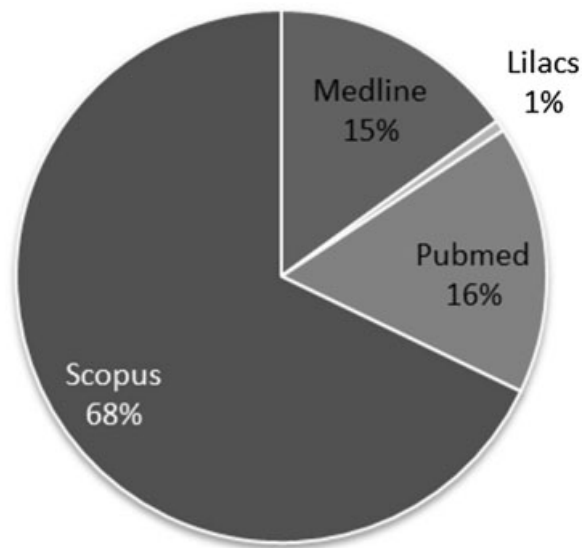
For this analysis, titles and abstracts of the works found were read, and, when they met the inclusion criteria, the works were read in full and analyzed as to their objectives, methods, results, and conclusion. The search was carried out without time limitation.

**Results**

In all, 1,055 articles from 1968 to 2013 were found, of which 159 articles were located in Medline, 7 in Lilacs, 173 in PubMed, and 716 in the Scopus databases. ► **Fig. 1** shows the percentages related to the results found in these databases.

The results of the articles located through the combination of the keywords DeCS/MeSH, considering all the databases, are shown in ► **Table 1**.

Thus, the titles of the 1,055 works found were read, and 991 were discarded through the exclusion criteria. Of the 64 abstracts read, 47 were not considered; 17 seemed to meet the inclusion criteria were read in full, resulting in the exclusion of another 13 additional articles. This way, 4 articles were effectively included in the present study, and the results obtained through the analysis of the selected articles, concerning the purpose, methods, results, and conclusion, are shown in ► **Table 2**. One article was located in Lilacs, one in PubMed, and two in Scopus; two were published in 2006, one in 2009, and one in 2012.



**Fig. 1** Percentages of the results obtained in the databases consulted.

**Table 1** Articles found through the combination of keywords in the databases searched in this study

Combination of the keywords DeCS/MeSH	Number of articles found
Combination 1	363
Combination 2	354
Combination 3	114
Combination 4	71
Combination 5	65
Combination 6	88
Total	1,055

**Discussion**

Considering the high prevalence of OSAS and the low rate of diagnosis, it is important to highlight the value of the studies directed to health education intended for the population in general and for health care professionals, enlarging the access to reliable and current information, focusing on assertive evaluation, and, mainly, guiding measures of prevention to this condition.

Based on the articles found in the search for this study, more results were observed in the Scopus database and fewer in the Lilacs database. Most publications were found in the SciVerse Scopus, as its scope is international, with more than 18,000 titles of 5,000 international publishing companies, and it provides author and institution profiles, citation tracking, h-index, and journal analyzer. Moreover, articles in press of more than 3,000 periodicals are available—that is, those articles that were accepted but have not yet appeared in a regular edition of the journal.<sup>36</sup> On the other hand, the Lilacs database, through which fewer works were obtained, restricts its scope to Latin America and the Caribbean and has

**Table 2** Analysis of the articles included, concerning the objective, methods, results, and conclusion

Author, year	Purpose	Methods	Results	Conclusion
Conway et al. <sup>32</sup>	To promote a campaign to increase the awareness on sleep disorders	Resources of media, exhibits, and lessons were used to reach 2,000,000 people and 55,000 health professionals, evaluating the referrals made after the information was supplied in a hospital.	A slight increase in the diagnosis of obstructive sleep apnea syndromes was observed, among other sleep disorders, through the referrals made.	Health professionals seemed to have a higher understanding of sleep disorders.
Stremeler et al. <sup>33</sup>	To assess the viability and acceptability of information about sleep by postpartum mothers	Behavioral-educational intervention with first-time mothers in the postpartum period was performed by nurses, on sleep information, by means of a book.	Children from the sleep intervention group had less nocturnal waking and more total sleep time.	A more adequate sleep was provided for both mother and child.
Moseley and Gradisar <sup>34</sup>	To investigate the effectiveness of an intervention in the increase of knowledge about sleep directed to adolescents	Adolescents received four lessons on promotion and maintenance of a healthy lifestyle, reflecting on the quality of sleep.	The program increased the adolescents' knowledge about sleep.	The interventions proposed for the adolescents, emphasizing the reduction of practices that are detrimental to sleep, were valid.
Bandla et al. <sup>35</sup>	To compare the level of satisfaction and economic factor on sleep medicine, presented virtually and in a face-to-face format	Medical students were instructed on sleep medicine in one of the two formats: face-to-face or online modules.	The pupils who participated in the face-to-face format were more satisfied than those who participated online. The learning and its costs were approximately equivalent for both formats.	The results between the two methodologies were similar, with the online platform being economical and educationally feasible.

contributed for 27 years to the increase of the visibility, access, and quality of health information.<sup>37</sup>

A difference in the results obtained in relation to the amount of articles found, when using six different combinations, was verified. When combination 3 was used, in the English and Portuguese languages, more results were verified, whereas with combination 6, fewer results were found. Such findings can be justified by the fact that "Health Promotion" represents a wider concept, including the objective of an excellent level of life and health, and "Primary Prevention" presents the objective for illness prevention,<sup>38</sup> according to modern concepts of health promotion and primary care, initiated after the Ottawa Charter for Health Promotion.<sup>39</sup>

After the 1,055 articles were read, 93.9% of the articles were excluded in this first stage, for even using keywords and specific combinations related to health promotion, sleep disorders, and OSAS, many of the studies were aimed at the diagnosis, assessment, treatment, and characterization of OSAS cases and other sleep disorders. This finding suggests that the scientific research has prioritized investigations directed to diagnosis and intervention. On the other hand, in the area of health, the importance of health promotion has been described as well, although unplanned actions have been observed or restricted to a certain number of people,<sup>40,41</sup> thus limiting the results achieved.

Only recent articles, dating from 2006 to 2012, composed the results of this work, thus the theme is quite current. Moreover, the actions taken were directed not only to health professionals, but also to doctors,<sup>32</sup> medical students,<sup>35</sup> postpartum mothers,<sup>33</sup> and adolescents.<sup>34</sup> The value of the actions directed to professionals/students in the area of health, such as pharmacists<sup>42</sup> and pediatricians,<sup>43</sup> is highlighted, due to their qualification on sleep disorders, so as to improve the diagnosis of OSAS. Actions are also important for the general population, including children and adolescents, because of their increased risk of OSAS caused by behaviors that are detrimental to a good quality of sleep, such as insufficient amount of sleep, television sets in the bedroom, and late and variable bedtimes.<sup>44</sup>

The studies presented several methods in the transmission of knowledge, such as lessons in the face-to-face format,<sup>34,35</sup> online modules, book discussions,<sup>33</sup> and media and exhibit resources.<sup>32</sup> The possibility of doing an online screening of those at risk of OSAS was noted,<sup>45</sup> as well as guidance to assist parents in dealing with the diagnosis of insomnia, by means of the Mini-Kiss online.<sup>46</sup> The positive results obtained through localized actions support the need for specific methods for health education according to the profile of the target public.

In the four selected studies, increased sleep knowledge by adolescents and medical students after the actions was

verified,<sup>34,35</sup> as well as increased rate of diagnosis of mild OSAS and other nocturnal sleep disorders,<sup>32</sup> reduction of waking, and increased nocturnal sleep in babies.<sup>33</sup> Such findings show that planning actions for the diagnosis of OSAS directed to the largest number of individuals is paramount, as in the study of Conway et al.<sup>32</sup> Teaching about suitable treatments and incentives for the appropriate procedures in each case is also important,<sup>47-49</sup> demonstrating that an assertive diagnosis should be associated with a successful treatment.

Only articles in Portuguese, English, and Spanish were selected after the headings of the articles were read. Thus, the language of the works was not a limiting factor for the research. Moreover, the search in the Virtual Private Network system, which provides a myriad of journals, enabled the reading in full of all selected articles, a contributing factor for the development of the study.

In addition to the investigation of articles published on preventive actions to health care, future studies be performed investigating Web sites related to the subject, as well as actions by official scientific organizations in the field of sleep medicine. Hence, reliable information regarding education on health aimed at OSAS can be found, such as the actions promoted in World Sleep Day in the official Web site and organized by the World Association of Sleep Medicine, which aims at emphasizing the importance of quality of sleep.<sup>50</sup>

The lack of scientific studies focusing on health promotion in OSAS demonstrates that further research using this approach, directed to both professionals and the population, is necessary, aiming at minimizing the consequences that such clinical condition brings to those affected.

## Final Comments

A literature review of studies on health promotion specifically involving preventive actions of health care in sleep disorders, with emphasis on OSAS, was presented. Four studies that increased the knowledge of the population, professionals, and health care students on health and sleep disorders were found, promoting assertive referrals by health care professionals and the adherence of the population to more favorable behaviors, aiming at suitable sleep.

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