

Educational Program Applied to Obstructive Sleep Apnea

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Abstract

Introduction: Educational program could optimize health promotion by acquisition appropriate behaviors. Specifically about the Obstructive Sleep Apnea, large portion of the population present this syndrome, but there is a little knowledge about that.

Objective: To implement and analyze the effectiveness of: an educational program on the theme “Obstructive Sleep Apnea”, based on the dynamics of the Young Doctor Project (*Projeto Jovem Doutor*).

Methods: The knowledge multiplication strategies were comprised of creation of the educational material and implementation of the training program (face-to-face classes, practical activity, access to the Cybertutor, social action). Next, an assessment was performed by applying the investigation questionnaire of the level of knowledge and the Motivational Research Form.

Results: A total of 5 students participated and became Young Doctors after the educational program. Orientation about the theme was carried out by means of banner, folder, TV news, puppetry and mime game. By the end of the Cultural Event, knowledge had been multiplied to 985 people from the community.

Conclusions: Therefore, an educational program model on Obstructive Sleep Apnea was implemented based on the dynamics of the Young Doctor Project. Success was verified in its development, in the students’ motivational aspect and in the knowledge dissemination.

Keywords: Sleep apnea; Obstructive; Speech; Language and hearing sciences; Telemedicine; Distance Education; Educational program

Introduction

In Brazil, it is observed the expansion of educational program policies, the use Telehealth, which optimize health promotion by enabling a greater involvement of people and a motivation for acquiring more appropriate behaviors besides enabling to reach a greater number of people [1].

In this sense, the Young Doctor Project aims to involve students from elementary and high school in proposals aimed at the educational program, using diversified dynamics, so that, they become Young Doctors, responsible for multiplying the knowledge about health themes [2]. In the Speech-Language Pathology and Audiology, it enables the approach to Communication Processes and Disorders, a greater adherence to appropriate intervention and preventive measures [3-5].

Specifically in the area of Orofacial Myology, the Speech-Language Pathology and Audiology has addressed patients with Obstructive Sleep Apnea (OSA) [6] due to the total/partial upper airway collapse during sleep, mainly [7]. Its consequences have a direct impact on the individual’s health, such as cardiovascular events [8] and cerebral vascular accident [9], as well as on public health, considering the increase of occupational and traffic accidents [10]. Regarding the speech-language pathology and audiology aspects, consequences such as impairments in memory [11], attention [12] and school performance [13] are verified.

For the Brazilian population, particularly, a study in the city of São Paulo verified a 32.8% prevalence of OSA [14], while world studies, carried out with a wide sample and a methodological rigor, observed a prevalence from 9 to 28% in the North American and European population [15-17].

Considering the consequences of OSA, the involvement of a

speech-language pathologist and audiologist is fundamental in health promotion actions to enable a greater awareness of the population.

This study has the hypothesis that training young students on the theme of OSA by means of the Telehealth and the Young Doctor Project may promote the knowledge multiplication to the whole community involved, thus establishing a health production chain.

Objective

To implement and analyze the effectiveness of an educational program on the theme “Obstructive Sleep Apnea” based on the dynamics of the Young Doctor Project.

Methods

The research was approved by the Institutional Review Board, under the assent number 045911/2012. All participants presented the consent of their responsible ones, which was done by reading and signing the Consent Form.

Participants

The invitation to participate students between 13 and 14 years old, enrolled in elementary school in a state school located in the city of Bauru, state of São Paulo.

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The inclusion criteria were considered: signing of the consent form, interest and availability to participate in the meetings and activities proposed. Students who did not take part assiduously in the meetings and activities were excluded.

Procedure

Figure 1 shows the flowchart with the stages of the Young Doctors Training Program on OSA.

Strategies of knowledge multiplication:

Elaboration of the educational material: Teaching materials were created based on research carried out on the databases and in scientific books: Materials for the face-to-face classes, content for the Cybertutor, Game for the practical activity, Banner and Folder. The materials obtained went through a revision process, an analysis of text readability [18] and illustrations to facilitate the participants' learning.

Implementation of the training program: Based on the proposal of the Young Doctor Project [2], the training program was comprised of face-to-face classes, practical activity, access to the Cybertutor and social action.

Face-to-face classes: Face-to-face classes were composed of lectures that aimed at training the students. Each class lasted 3 hours on average and took place in the school, using a teaching material created with the software Microsoft® Office PowerPoint as well as dynamics to promote a constant evaluation of the knowledge and a greater involvement of the students.

Practical activity: It aimed at stimulating learning by leading students to understand the importance of the breathing function during

the day and the night by means of a workshop with a mime game. This activity aimed at solving doubts and reaffirm the knowledge that had already been worked with.

Access to the cybertutor: The access was asynchronous, in which each student received a login and created a password, and had a deadline of 18 days to carry it out according to their availability. Besides the informative content, the Cybertutor presented short-term evaluation questions by the end of each module to identify the exploitation of the content.

This tool included the Discussion Forum, aiming the interaction and the proximity between the participants and the researcher, with three questions in chat format, stimulating the debate and reflection on the content.

Social action: There was a Cultural Event in the school so that all students and the community could participate in the program and receive information from the Young Doctors in a proposal to multiply the knowledge. Besides the suggestions of the students trained, a pedagogue and two coordinators of the school helped to define the activities that would be done. The 5 "Young Doctors" received a certificate for the work done and a t-shirt. The program lasted 3 weeks of direct intervention with the school.

Evaluation

The last stage was the evaluation, performed by means of the knowledge investigation questionnaire and the Motivational Research Form.

Investigation questionnaire of the level of knowledge

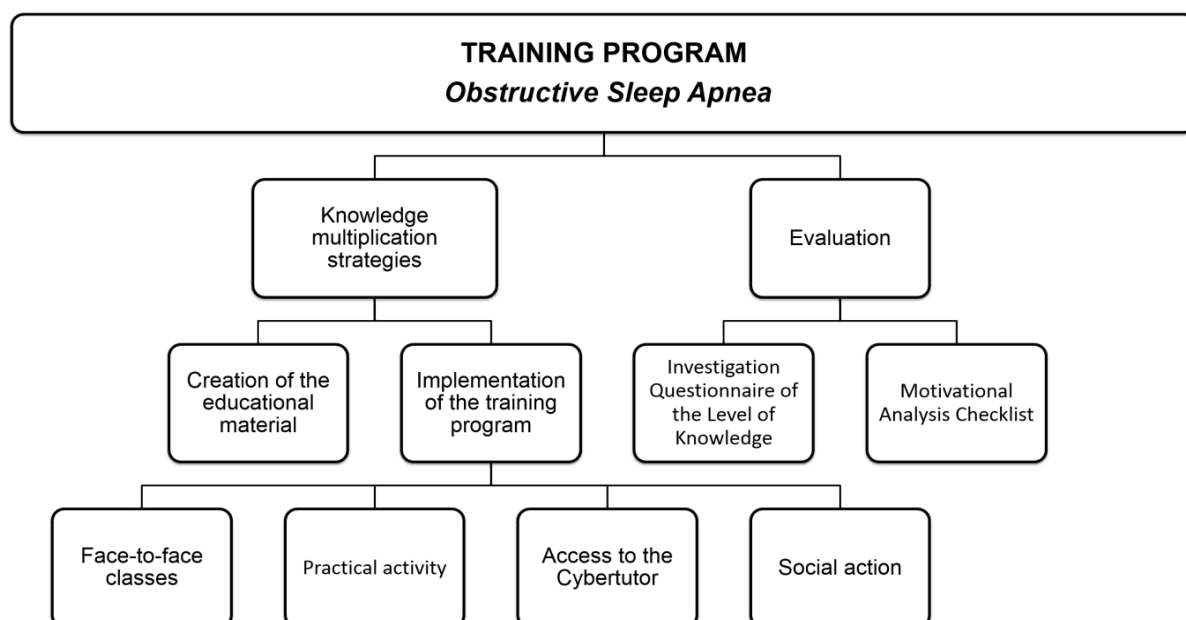


Figure 1: Flow chart with the study stages of the Training Program on OSA.

It was comprised of 13 questions with different formats: multiple-choice, discursive, true or false and problem-solving situations considering the theoretical basis and the main topics of the training (APPENDIX).

Regarding the scoring of the questionnaire, the questions were divided in blocks.

1st block: questions about sleep hygiene (1 to 4). Score scale from

5 to 1, considering the levels of more appropriate answers related to behaviors favorable to a good sleep quality.

2nd block: questions about OSA specific knowledge (5 to 14). Score scale of 1 point for each correct answer. Regarding the true/false questions, a score of 0.25 was attributed to each correct statement for the four statements of the question 11, and a score of 0.20 was attributed for the five statements of the question 14.

3rd block: comprised of two questions of problem-solving situations. For the question number 15, a score of 1 point was attributed to each correct tip for a better sleep written by the student, comparing the before and after the training program results. Question 16, on the other hand, was analyzed qualitatively in the pre and post-questionnaires.

Motivational research form (MRF)

The MRF [19] subjectively evaluated the motivational aspects of the access to the Cybertutor, and it was comprised of 32 statements, ranging from 0 to 24 points. They were gathered according to the expression: $V=E+S$; $XS=O+F$. The V score is the sum of the domains "STIMULATING" and "SIGNIFICANT" and it reflects the dimension value, that is, how valuable this training program is. The XS score is the sum of the domains "ORGANIZED" and "EASY TO USE" and it reflects the dimension Expectation to Success.

In addition to the calculus mentioned above, there is a recommendation to use a Cartesian projection. The abscissa (X axis) is the score that corresponds to the dimension Value and the ordinate (Y axis) is the score that corresponds to the dimension Expectation to Success. If most of the individual points are located within the right superior area (1st quadrant), it means that the training program is an "Impressive Course", that is, the evaluation is positive [20].

Data analysis

Descriptive statistics was used to describe data and analyze the quantitative and qualitative parameters. In the inductive statistics, the Wilcoxon Matched Pairs test was used for the quantitative data and the McNemar statistical test was used for the qualitative data; they were conducted in the STATISTICA 12 software (StatSoft Inc., Tulsa, USA). The significance level used was $p<0.05$. Data from the knowledge investigation questionnaire collected before and after the implementation of the methodology of the Young Doctor Project on OSA was analyzed.

Results

Five students finished the training program proposed on the OSA theme, and they were effectively called Young Doctors.

Procedure

Strategies of knowledge multiplication

Elaboration of the educational material: The educational material for the face-to-face classes, the cybertutor, the practical activity, the social action and the assessment were developed (Table 1).

Implementation of the training program:

Face-to-face classes: There was an active participation of the students with the reports of experiences. The use of answer signs and reward coins encouraged the students' participation and interaction in the group (Figure 2).

Practical activity: The practical activity (mime game) happened in a relaxed way, reinforcing the knowledge previously addressed (Figure 3). At the end, the students asked to play again.

Access to the cybertutor: The contents of the Cybertutor were accessed by all students and the researcher monitored them remotely and visited the school periodically.

The students were successful in the first time up to the third attempt of the short-term evaluation question and they gave more one answer to each question of the discussion forum

Social action: The spreading of knowledge was leaded by the Young Doctors, it happened through a theater play with puppets presented to 1st to 3rd year students ; a mime game for 4th to 5th year students; posters made of paper, banners, folders and TV news for 6th to 12th year students, parents, teachers and employees.

Such actions resulted in the multiplication of information on the OSA theme for 70 parents and friends, 845 students, 50 teachers and 20 employees of the school, summing a total of 985 people (Figure 4).

Evaluation

Investigation questionnaire of the level of knowledge

The Table 2 presents the comparison between the results pre and post-training regarding the questions. An increase of the score was observed for all questions, but only question 4 showed a statistically significant result.

In the comparison of the answers of the question 16 before and after training, regarding the identification of the OSA, it was possible to observe greater details of the possible condition represented by the image provided in the question, besides a more appropriate behavior, specifying the need of seeing an otorhinolaringologist in some answers.

Motivational Research Form

The Cartesian projection with the students' answers (Figure 5) shows that 100% of the Young Doctors considered the Cybertutor as an "Impressive Course!"; the scores of the X axis (Value) and the Y axis (Expectation to Success) in all answers resulted in high indexes, evaluating the Cybertutor positively.

Discussion

Through the bibliographical survey, it was not possible to find specific literature associating the OSA with the Interactive Tele-education with a focus on educational program. Therefore, it is possible to notice the relevance of carrying out the dynamics of the Young Doctor Project on OSA, alerting for the disease consequences, mainly in relation to its high incidence and also to the low rate of diagnosis and treatments.

The invitation to take part in the project was done to students, 13 accepted taking part in the activity and 5 concluded the program. Differently, Corrêa et al. carried out the project on another theme in a private school in the same city, initiating and finishing with the training of 41 Young Doctors [21].

During face-to-face classes, students were observed to participate in the study in an active and interested way. This is believed to have happened due to the differential of the teaching proposal as, whenever there are mediation strategies, there is the possibility of a greater interaction with the content, consolidating the motivation and the self-system of the student, decisive factors in the cognitive performance [22]. We highlight mediation is interactivity summed with the valuing of the

	FACE-TO-FACE CLASSES		CYBERTUTOR				PRACTICAL ACTIVITY	SOCIAL ACTION		EVALUATION
Material designed	Audiovisual aid	Questions inserted in the classes	Content of the Modules	Content of the Additional Modules (the access was not necessary to complete the course)	Short-term evaluation questions	Discussion Forum	Mime game	Banners	Folder	Investigation questionnaire of the level of knowledge
Aid used	Microsoft Power Point slides	10 multiple-choice and true/false questions and signs with the alternatives	OSA – 6 topics; Diagnosis and Treatment – 8 topics Prevention – 3 topics	OSA – 3 topics; Diagnosis and Treatment – 1 topic Prevention – 3 topics	Five true or false questions	Three questions to be debated in chat format	1 board, 1 dice and 24 cards	2 banners with 120 × 90cm printed on canvas	500 folders printed in A4 sheets, folded in three parts	16 questions in different formats (multiple-choice, discursive, true or false and problem-solving situations) (APPENDIX)
Objective/ Questions	Address the importance of nasal breathing and an appropriate sleep, possible alterations, definition of the OSA, causes, consequences, diagnosis, types of treatments and how to prevent the OSA	Interact with the researcher, solving possible doubts	Explain the importance of nasal breathing and an appropriate sleep, possible alterations, definition of the OSA, causes, consequences, diagnosis, types of treatments and how to prevent the OSA		Evaluate the short-term knowledge	1. Why is it important to breathe well during the night? 2. Who does the Polysomnography exam? Which treatments can this professional indicate? 3. Why is it important that more people know how to prevent the OSAS? How can we help in this task?	Address the theoretical contents in the practice with the simulation of daily situations	Address the synthesized topics of the OSA definition; diagnosis, treatment and prevention (sleep hygiene)		Evaluate knowledge through theoretical contents found on scientific databases

Table 1: Materials designed, aids used and objectives of the face-to-face classes, cybertutor, practical activity, social action and assessment.



Figure 2: Face-to-face classes and use of signs.

experiences brought by each person, generating the construction of new knowledge for the one who is in the role of the learner and also for the one who is teaching [23].

The Cybertutor has showed efficiency in others studies too on different themes, which suggests its importance in the complementation of the teaching in Audiology [3], Voice [4], Oral Health [24], Breastfeeding [25] and Genetic Syndromes [5].

The dynamics of the practical activity recovered concepts that hadn't been consolidated yet and strengthened the link between the team members, favoring the dissemination of the knowledge. These activities enable to demonstrate the applicability of the knowledge in the routine of the students [26].



Figure 3: Mime game used during the practical activity.



Figure 4: Activities developed by the Young Doctors during the social action, involving 1st to 3rd year of the Elementary School students, parents and teachers.

Block	Question – subject addressed	PRE	POST	p
1st block Behaviors related to sleep hygiene	Duration between Q1 and Q2: Time one sleeps and wakes up	7 h 16 min	8 h 30 min	0.07
	Q3: Latency time of the beginning of sleep	10 min	8 min	0.59
	Q4: Personal questions on sleep hygiene	2.6	1	0.04*
	Q5: Snoring definition	0	1	0.07
2nd block Theoretical concepts on the OSA	Q6: OSA definition	0.2	1	0.13
	Q7: Oropharyngeal structures	0.4	1	0.25
	Q8: OSA causes	0	0.8	0.13
	Q9: OSA symptoms	0.2	0.6	0.48
	Q10: Professional for the diagnosis of the OSA	0	1	0.07
	Q11: Polysomnography	0.7	0.85	0.11
	Q12: Treatment with CPAP - Continuous Positive Airway Pressure	0	1	0.07
	Q13: Treatment with Speech therapy	0.2	1	0.13
	Q14: OSA prevention	0.76	0.76	1
3rd block Problem-solving situations	Q15: Tips of sleep hygiene	1.4	5.2	0.07

Table 2: Inductive statistical analysis of the questions 01 to 15, presenting the result pre and post-training and the p value.

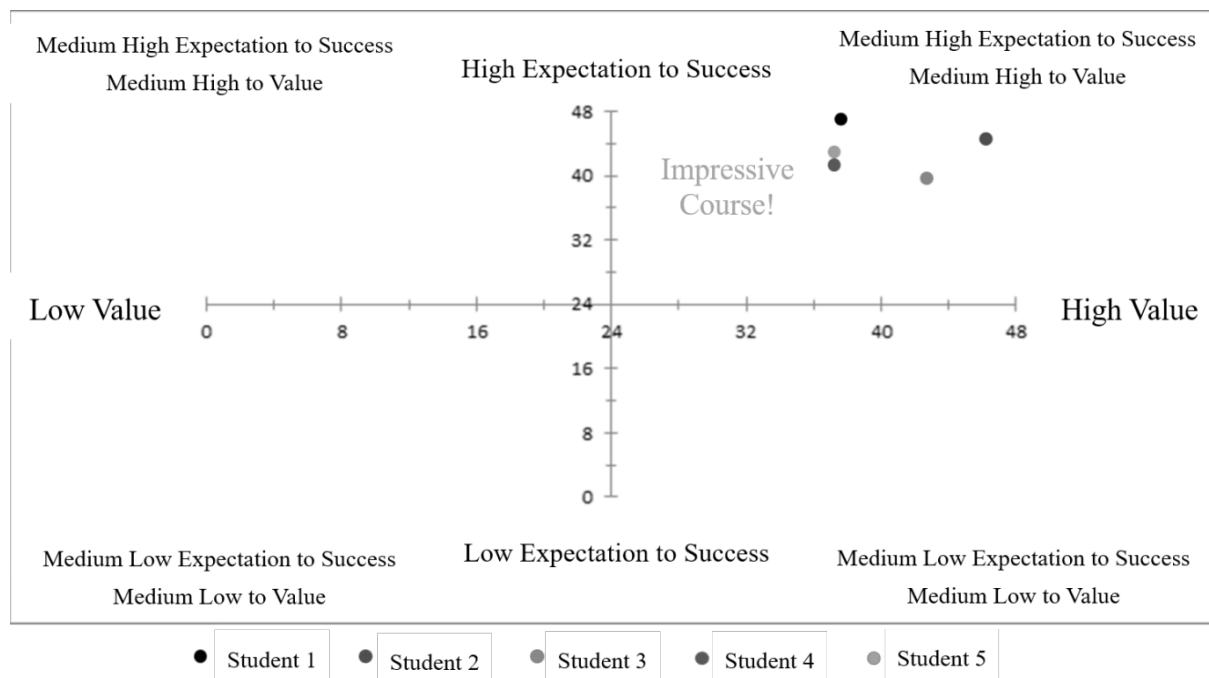


Figure 5: Cartesian plan with the intersection points according to the students' evaluation of the Motivational Research Form with the Value in the X axis and the Expectation to Success in the Y axis.

The moment of the social action was comprised of different activities in order to reach populations from many age groups, involving them in the proposal of the health promotion: posters, banners, folder, video of TV news, mime game and theater play. So, a previous planning was necessary, corroborating with the proposal of LEOPOLDO et al. in actions of health promotion [27].

The expressive number of 985 people directly instructed on the subject evidences that the training of five Young Doctors could engage parents, students and school employees. This potential to multiply the knowledge is observed compared to the study on the theme Auditory Health, which trained 14 Young Doctors, disseminating the information to 300 people [3], while in the study on Vocal Health, the training of 14 Young Doctors spread the knowledge to 1300 people in the community

[4].

The question that investigated the unfavorable behaviors to the sleep presented a statistically significant difference between the two moments. Highlighting the considerable impact the attitudes of sleep hygiene present in the sleep quality, for example, patients with a diagnosis of OSA that after receiving the folder with explanations and adhering to such tips, observed an improvement of their complaints, reaffirming the relevance of the use of the folder in the moment of the knowledge dissemination in the social action [28-29].

No significant results were found regarding the theoretical contents on OSA in the comparison between the application of the pre- and post-training, possibly due to the size of the sample. On the contrary, there was statistically significant difference in the assessments in the

studies on Auditory Health [3], Vocal Health [4] and Cleft Palate [21] that presented a bigger number of participants. However, in a qualitative analysis, an increase was observed in the number of correct answers after the Project, similar to the study whose target population was comprised of adolescents with sleep disorders [30].

With the problem-solving situations, it was possible to carry out a differentiated analysis regarding the evaluation model, not measuring only in an objective way, but valuing the expression of the theoretical knowledge combined with the experience of the attitudes of the student routine. In the view of the modular psychopedagogy, this kind of evaluation enables a greater reflection and potentiates the student capacities as it develops strategies that favor effective learning [22]. Thus, the educational model based on the dynamics of the Young Doctor dynamics may influence the application of the knowledge in the individual's routine as it is comprised of strategies that motivate this change in the behavior, which suggest the improvement of the evaluations to measure this aspect.

Continuing in the process of evaluation, the Cybertutor was classified by the students, regarding the motivational aspect, as an "Impressive Course", obtaining a high Value and a high Expectation to Success taking into account the four dimensions evaluated (Figure 5). Thus, the Motivational Research Form has showed relevance in the execution of constant reviews of such courses for the adequacy to the target public and objectives of the intervention [19], and it has shown efficiency in the themes Auditory Health [3], Vocal Health [4], Genetic Syndromes [5] and Cleft Palate [21].

This study contribution was the training of a group of students on the theme OSA and the stimulus to create a knowledge productive chain, highlighting the benefits of the prevention for the participants, their family members and friends. Therefore, actions like this must be extended so that the results can interfere directly in the OSA prevalence indicators, as well as in the indexes of occupational and traffic accidents.

Conclusion

This study enabled the implementation of an educational program on the theme "Obstructive Sleep Apnea" based on the dynamics of the Young Doctor Project, generating the dissemination of the knowledge to 985 people from the community. The Young Doctor Project succeeded in its evaluation as an educational program.

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