"Barnaby and his adventure"A vocal health education project in childhood dysphonia

"Barnabé e sua aventura":Um projeto de educação para a saúde em disfonia infantil

"Bernabé y su aventura" Un proyecto de educación para la salud en la disfonía infantil

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Abstract

Vocal nodules, etiologically associated to vocal abuse and misuse, are one of the major factors for chronic dysphonia in childhood, in both genders. Childhood dysphonia may influence the effectiveness of dysphonic child's social relationships, and to lead to stigmatization and embarrassment by their peers. The developed health education instrument principally aims to aware dysphonic children to a correct

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Conflict of interests: *No*
Author's Contribution: CVC e ARC- Responsible for the conception and projection of the study, the design of the models, as well as for the creation of the tool for data collection (including software development). Responsible for the manuscript's first draft, for critical revision and the approval of the final draft presented. MRD - Final editor of the investigation project as well as the scientific manuscript in article formulation.

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Received: *22/07/2014;* **Accepted:** *20/12/2014*

use of their voice, decreasing biopsychosocial impact of this vocal disturbance. This instrument firstly aimed to children of both genders, in ages between seven and nine years old, and simultaneously to their parents and educators, consists in a child's literature book which addresses the problem of voice and child's nodular pathology, and it was made in two different formats: printed in A5 format and in digital format with audio narration included. This instrument, ideal for the target population, is a great vehicle to raise awareness of the importance of voice and promoting salutogenic vocal habits, so it can be used in various contexts of the child's life (therapeutical, familiar and educational).

Keywords: *dysphonia; Health Education; voice*

Resumo

Os nódulos vocais, associados etiologicamente a um comportamento disfuncional de mau uso e abuso vocal, são os principais responsáveis pela disfonia crônica em crianças de ambos os gêneros. A disfonia infantil pode influenciar a sedimentação das relações sociais da criança disfônica e conduzir a processos de estigmatização e constrangimento por seus pares. O presente instrumento de Educação para a Saúde tem como principal objetivo consciencializar a criança disfônica para o uso correto da sua voz, diminuindo o impacto biopsicossocial inerente à patologia vocal. Este instrumento, destinado essencialmente a crianças de ambos os sexos entre os sete e os nove anos de idade, e simultaneamente aos seus pais e professores/educadores de infância, consiste num livro de literatura infantil que aborda a problemática da voz e da patologia nodular infantil, tendo sido concretizado em dois formatos: impresso em formato A5 e em formato digital, com narração áudio incluída. O instrumento elaborado, ideal para a população-alvo pré-definida, consiste num excelente veículo de consciencialização da importância da voz e da promoção de hábitos vocais salutogênicos, podendo ser usado em diversos contextos de vida da criança (terapêutico, familiar e escolar).

Palavras-chave: disfonia; Educação para a saúde; voz.

Resumen

ELos nódulos vocales, etiológicamente asociados a un comportamiento disfuncional de mal uso y abuso vocal, son los principales responsables de la disfonía crónica en niños de ambos los sexos. La disfonía infantil puede influenciar la efectividad de las relaciones sociales del niño disfónico, y conducir a procesos de estigmatización y constreñimiento por sus pares. El presente instrumento de educación para la salud tiene como principal objetivo aumentar la conciencia del niño disfónico para el correcto uso de su voz, reduciendo el impacto biopsicosocial inherente a la patología de la voz. Este instrumento, diseñado esencialmente para niños de ambos sexos, entre siete y nueve años de edad, y simultáneamente para sus padres y profesores, es un libro de literatura infantil que aborda el problema de la voz y de la patología nodular infantil, habiendo sido implementado en dos formatos: impreso en formato A5 y en formato digital con narración de audio incluida. El instrumento elaborado, ideal para la población objetivo previamente definida, es un excelente vehículo para aumentar la conciencia sobre la importancia de la voz y la promoción de hábitos vocales saludables y se puede utilizar en diferentes contextos de la vida del niño (terapéutico, familiar y escolar).

Palabras clave: *disfonía; Educación para la Salud; voz*

Introduction

The human voice is the most elaborate and peculiar interpersona[1] communication system, which has significant repercussions on the level of inter-peer social relationships1. Vocal production is a result of the motor activity that involves a complex aerodynamic and biomechanical process that requires precise and well-timed neuromuscular coordination from both the respiratory, laryngeal and supralaryngeal systems[2].

Concerning the anatomy and physiology of the phonation, the larynx deserves special considerations due to it being a component of the vocal mechanism, mostly because the vocal folds, whose vibratory phenomena correspond to phonation, are located in the larynx[1].

Commonly referred to as "hoarseness", dysphonia is defined as a disturbance of speech articulation characterized by a change of the vocal capacity, of pitch and loudness, or by a vocal effort that impairs communication or reduces the quality of life[3]. This disturbance may affect individuals belonging to any age group[4].

Dysphonia is common among children[5] and most epidemiological studies show a prevalence of dysphonia among [6] to 9% of the child population6. These studies, however, also reveal a variable incidence rate of child dysphonia depending on the geographical location of the said population, on the adult attention regarding this problematic, on the methodological considerations and on the focus of the research in this empirical ground[7].

Vocal nodules are considered the most common lesion in this age group4, being that several authors estimate that the incidence rate of these lesions is responsible for cases of chronic dysphonia among children of both sexes6,8. Nodules during childhood are lesions of bilateral mass, exophytic, mostly edematous, located on the anterior end of the vocal fold[8].

The incidence rate of nodules among children has its peak between the ages of 7 and 9, which can be explained by a greater involvement of children in group activities at school. There is a greater prevalence of these lesions among boys, probably due to a greater response to the social demand of a more aggressive vocal activity within this gender, or even as a demonstration of a precocious marker of male sexual identity[8].

Vocal nodules are etiologically associated with a chronic behaviour of vocal abuse and misuse, being characterized by phonatory trauma, which includes a list of inadequate behaviour such as: excessive use of the voice, speaking with a high output, the absence of pauses for respiration during discourse, speaking with either too low or too high a pitch, speaking during inspirations, strained vocalization, imitating sounds, noises and animals. Nodules are therefore likely to be found in children apt to speaking loudly, who are yelling constantly or producing harmful noises imitating animals, vehicles, as well as, imaginary cartoon heroes or monsters[8,9].

The origin of these nodules, however, is multifactorial. Indeed, child dysphonia has been associated with allergological and psychoemotional factors[8], some authors believing that children diagnosed with nodules are often those suffering from anxiety, perfectionism, aggressiveness, immaturity, lack of self-control or having difficulties in dealing with stressful situations, as well as, children suffering from neurotic conflicts[8,10]. On the other hand, there are studies that refute whether these psychological behaviour traits are associated with children suffering from vocal nodules[11].

Since the voice is one of the most important means of expression of the human being, as the main tool for oral communication, its alteration may have different psychosocial repercussions. During childhood, dysphonia may have nefarious consequences on the development of the ability to adequately communicate in a social environment5 due to how the vocal ability effectively influences social relations, and its alteration might lead to phenomena of stigmatization and constraint from the colleagues of the child suffering from dysphonia. The variance in vocal ability may cause the child to be segregated, compromising both his/her school and social routine[5,6].

Concerning therapeutic intervention on vocal nodules found among children, vocal therapy is the most favoured way of conduct, surgery being advised only in cases of constant and repeated aphonia or when cystic differential diagnosis becomes of foremost importance[8]. Other authors agree that the treatment of choice in cases of vocal nodules is vocal re-education[5].

However, in order for the vocal therapy to be successful, awareness and discipline are needed, both by the children and by their parents and family,

in everyday activities[10]. This awareness may be incorporated pedagogically with the aid of several ludic materials, such as games or stories[12] created and adapted specifically to the therapeutic setting.

Resorting to ludic tools allows the child to amplify his/her symbolic reasoning, functioning as well as a relational format par excellence in the therapeutic relations[13]. Ludic activities function, in this way, as a privileged means to establish contact with the child[14].

Taking this into account, the construction of tools for health education targeting the empowerment of the child with dysphonia caused by vocal nodules becomes of pertinence. Moreover, these tools are often identified as a particular need due to the lack of pedagogical tools designed for that aim[15].

The goal of the present health education project is to create a tool of intervention that can be applied to child dysphonia by nodular etiology by means of which we might further raise awareness for the basic mechanisms of vocal productions, of pathological aspects of vocal nodules, of etiological vocal behaviour that must be avoided and which healthy vocal behaviour should be adopted by the child.

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Description of the tool

The target audience of this health education tool is children of both sexes between the ages of 7 and 9, which corresponds to the period with higher incidence levels of vocal nodules among children8.

This project is also intended for a secondary target audience: parents and teachers, mostly because they play a strategic role in health education16 and specifically in the adoption of healthy vocal behaviour. Hence, indirect therapy of child dysphonia might reach both school and home environments, in other words, the child's everyday reality.

It should also be mentioned that, although aimed specifically at ages between 7 and 9, this tool is also adequate for the intervention among children with ages below 7 and, as such, might equally be used by teachers in a pre-school context.

The tool is a children's book entitled "Barnaby and his voice adventure" and it was conceived in two formats: a printed format in A5 size and a digital format. The reason for developing a manual for children's literature as a tool of intervention during childhood was the fact that a book is a tool that expands the mind and unlocks an imaginary space for reflection, as well as dialogue, and it allows for several interpretations that can be drawn from any clinical situation. Hence, resorting to books for therapeutic purposes - bibliotherapy – allows guiding the child's thoughts and shaping their behaviour while developing coping strategies by means of projective mechanisms. This book promotes discussion, as well as, analysis of situations in a carefree environment (thus reducing the anxiety in the child) that should facilitate their comprehension/apprehension of new meanings17, and is envisioned as a form of enabling.

The story portrayed in the book is a fable whose main character is Barnaby, a lion whose voice became hoarse because of his conducts of constant vocal misuse and abuse, and who needs, therefore, to resort to the services of the Speech and Language Therapist Owl in order to improve his voice.

It starts with the classic fairy-tale opening in Scene 1 (Figure 1): "Once upon a time there lived a little lion named Barnaby in the most beautiful and peaceful savannah." This scene presents the main character and the setting where the narrative takes place – the savannah – and aims at highlighting the character's main psycho-behavioural traits, such as being "too restless" and "never listening to what friends or family have to say."

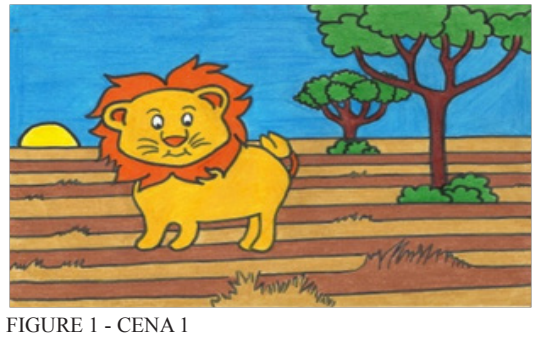

FIGURE 1 - CENA 1

Scene 2 explores the consequences of the behaviour mentioned in Scene 1, where the character's parents and friends plea to Barnaby to reduce the frequency and intensity of his vocal

and pathogenic conduct, even though he will not follow their advices.

Scene 3 presents the day when Barnaby wakes up with a hoarse voice. This same hoarseness being the first audio-perceptible sign that something was wrong with his voice. Additionally, this same scene portrays Barnaby's indifference towards this sign, as well as, the persistence in his vocal and pathogenic behaviours, which continue in Scene 4.

It should be noted that Scene 4 (Figure 2) focuses particularly on the psychosocial impact of voice since his animal friends, with whom he kept daily company, noticed an alteration in his vocal capacity (the hoarseness in his voice), stating: "Your voice sounds very weird", going as far as considering it unpleasant as well as adding: "Your voice is upsetting me and giving me a headache!"

FIGURE 2 - CENA 4

In Scene 5 his parents show a serious concern when faced with Barnaby's hoarse voice declaring the need to resort to the services provided by the Speech and Language Therapist Owl. Hence, Barnaby realizes that he should, in fact, turn to therapeutic aid in order to improve the state of his voice.

Scenes 6 (Figure 3) and 7 already take place in the Speech and Language Therapist Owl's office, where the owl explains to both Barnaby and his parents the main anatomical, physiological and pathologic aspects of vocal production and vocal nodules, as well as, the pathogenic vocal behaviours that originate it.

FIGURE 3 - CENA 6

In Scene 8 (Figure 4) Barnaby becomes aware of the psychosocial impact of his voice in his life and for the first time feels the need to take better care of his voice, going as far as asking questions to the Speech and Language Therapist Owl on which vocal health measures he should take for this purpose. Hence, in this scene we observe a change in Barnaby's attitude when confronted with the need to adopt vocal immunogenic behaviours, imperative to the subsequent therapy..

FIGURE 4 - CENA 8

Between Scene 9 and 12 (see Figures 5 and 6) the focus lies on the behavioural change, for which the Speech and Language Therapist Owl supplies adequate vocal orientation pertaining to the particular case of Barnaby, mentioning which pathologic vocal behaviours he should forsake and which immunogenic vocal conduct he should adopt instead (using pictograms).

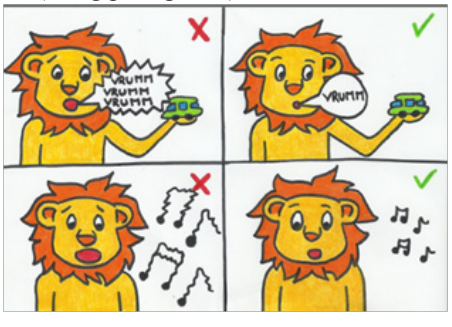

FIGURE 5 – Cena 10

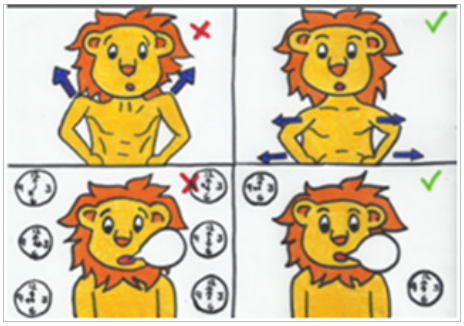

FIGURA 6 – Cena 12

Scene 13 serves to demonstrate Barnaby's own motivation and determination in following the advice given to him by the Speech and Language Therapist Owl in order for the child, by identifying himself with the main character, to become motivated in initiating therapy.

Scene 14 (Figure 7) details the process of behavioural change, i.e. it shows some care measures adopted by Barnaby in his everyday life, and Scene 15 highlights this same change through positive reinforcement as portrayed by the joy felt by the parents for their son's voice being "less hoarse and prettier", as well as, the fact that "it no longer sounds strange or causes headaches in anyone" (his voice having less of a negative psychosocial impact on his everyday life).

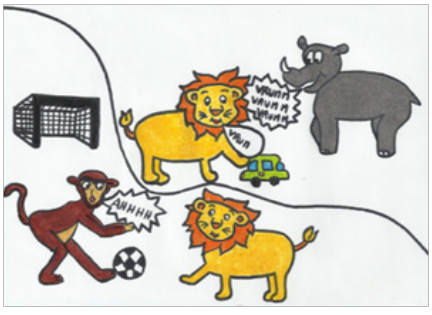

FIGURA 7 - Cena 14

The new Speech and Language Therapy appointment occurs in Scene 16 in which the successful change of conduct lead to the absence of vocal nodules and, therefore, of the hoarseness, Barnaby no longer having the need to attend the Speech and Language Therapy sessions.

Scene 17 (Figure 8) highlights that the preservation of Barnaby's vocal health will require the maintenance of all the immunogenic vocal behaviour, which has been assimilated, emphasizing the importance of voice and its great psychosocial impact in such a way that the child might come to understand that behavioural change must be permanent so as to avoid future relapses even after the completion of the organic pathologic component..

FIGURA 8 - Cena 17

Scene 18 concludes the story with the traditional: "Snip, snap, snout. Our tale of the voice is told out!"

Concerning the formats used in the conception of the book, it should be mentioned that the story is written and available both in print and digital formats, the book contains a cover/back over, as well as, eighteen pairs of illustration/text, in which sixteen pictograms representing the following opposing pathogenic and immunogenic vocal behaviours are included: speaking loudly versus speaking with an adequate intensity; yelling versus speaking with an adequate intensity; aggressive imitations of sounds versus avoiding imitations of sounds; singing with vocal stress versus singing without stressing the voice; speaking with a high output versus speaking with an adequate output; coughing persistently versus ingesting water so as to avoid coughing; use of an upper back respiratory pattern versus use of a costodiaphragmatic respiratory pattern; and lastly, excessive use of voice versus moments of vocal repose.

The decision to use pictograms was based on the fact that these are a simple and iconic object representation, being perceptible to the vast majority of users[18,19]. It becomes, therefore, an easy and fun mean of transmission to the child of which vocal behaviours should be adopted or avoided.

The book printed in A5 format was laminated and bound in order to make it resistant and waterproof, as well as, portable and easy to handle. However, once in the Speech and Language Therapist's possession as a tool of direct intervention, its

transmission to the child as means of indirect therapy becomes difficult, being therefore restricted to a therapeutic context.

In order to circumvent this limitation, the book was prepared in digital format by means of In Design CS (swf. file extension) software. This way the possibility of transmission of the book to children, as well as, education agents (be they parents or teachers) is assured, being it only necessary to duplicate the file in any other computer device. It should be mentioned that the book is of easy and versatile access in any computer or tablet, as the only requirement is Adobe Flash Player (free) software in the said device.

The digital copy offers the particularity of containing the audio-narration of the story, allowing an autonomous use by the child not yet able to read or who has a reading difficulty, since the child might still follow the story (by listening to it) without having to be helped by anyone else. This format allows, furthermore, the virtual manipulation of the page similarly to the physical one, becoming thus an interactive book of easy-use, both realistic and attractive to the child.

Both formats of the book complement each other, becoming a functional tool in various contexts: both regarding direct therapy - in a clinical context - and indirect therapy, due to it being adequate for use at home or even in school or in the kindergarten. This aspect is extremely important due to it consisting of a facilitator of therapy initiation, allowing for an extrapolation of the clinical barrier and transportation of the therapeutic effort to the several different contexts of the child's everyday life20.

Hence, although this book is aimed at the ages between 7 and 9, children younger than seven may equally benefit from this tool both autonomously, among family or in school, either the parents or the educators being invited to use it as a book of fables while promoting reading activities as well as the retelling of the story. It might be pertinent to highlight the importance of the strategic role parents and educators play in health education16 knowing how they actively influence the child in assimilating healthy behaviours[16,21]and how they might facilitate the child's awareness of the importance of the voice, as well as the acquisition of healthy vocal habits1[2,21].

Concluding Considerations

The afore mentioned tool for health education, produced in the form of a book of fables, emerges in the context of the creation of pedagogical and play tools aimed at the restructuring of clinical tools used in relational and pedagogical communication between the Speech and Language Therapist and the child.

The book, entitled "Barnaby and his voice adventure", has as its main goal supporting the direct and indirect intervention in the context of vocal therapy in children, finding in its core the child's awareness of the importance of the voice, while highlighting which are the basic mechanisms of vocal production, the main pathologic aspects of nodular pathology in children as well as which pathogenic vocal behaviours are to be avoided as opposed to the immunogenic vocal behaviour that should be adopted.

The double possibility for the use of the book in a therapeutic setting or in the context (be it in the family or school environment) of the child's daily routine should be emphasized, this tool becoming a facilitation in initiating therapy because it overcomes the clinical barrier and transports the therapeutic effort to the child's routine, in addition to allowing for an involvement by the parents/ educators in the process of vocal re-education. This last aspect is of great importance due to their daily interaction with the child, allowing them to monitor the child's vocal behaviours in everyday life.

This clinical tool is pertinent due to the lack of therapeutic tools available in European Portuguese aimed at the promotion of vocal health, according to the bibliographical review carried out for the purpose of this project.

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