

## 208 - AN ASSESSMENT OF THE BREATHING PROFILE ON CHILDREN WHO BEAR THE DOWN'S SYNDROME

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### INTRODUCTION

The Down's syndrome is a chromosomeopathy characterized by the additional presence of a chromosome in the 21st pair (BRUNONI, 1999). According to DSM-IV (Diagnostic and Statistical Manual of Mental Disorders), the DS bearer has learning difficulties.

The DS genetic alteration causes an unbalance in the human body cell functions, thus, making the DS bearers present injury in their organic system and, therefore, bigger sensitivity to some illnesses (Ibid).

As mentioned by Silva (2003), the tonus is an individual characteristic, that's why there's a variation from one child to another. The hypotonic muscle in the oral cavity in DS bearers affects the tongue position, decreasing the effective chewing and swallowing. It also alters the mouth opening and closing, what leads to the DS bearers to bigger chances of breathing and intestinal infections, as well as oral infections.

Consequently, the DS bearers have a lip, cheek and tongue tonus reduction; this last one keeps protrusive and, therefore, there's a lack of motor control of the parts responsible for the articulation. The palate (roof of the mouth), most of the times, is salient, and the lips remain half-open, what provokes mouth breathing. The breathing, as Ferreira (2006) defines, is the process of oxygen incorporation and carbon dioxide elimination.

According to Doull (2001), DS bearers, besides having chromosome abnormality itself, may present congenital malformation of the breathing, what increases the risk of breathing problems and injury caused by the facial hypotonicity, which prevents them from using the nose breathing. This concept is supported by Corrêa (2005), when he affirms that, because of their difficulty in breathing effectively through the nose due to hypotonicity, DS bearers use the mouth breathing to survive. This process of adaptation is called Mouth Breathing Syndrome (SRB).

The breathing diffusion may be present too soon, even in the first years of life. This makes us think that the diagnosis and treatment must be done as soon as possible, because the breathing function is directly related to the skull and face development, and it can cause functional alterations and adaptations that spread through the body (PONTE, 2000).

Based on what was developed before, the objective in this paper was to develop an assessment about the breathing profile on 4-to-10-year-old children who bear the Down's syndrome and live in Gurupi/TO, involving some representative aspects of the context which can lead these children to present breathing problems.

### METHODOLOGY

#### Typology and Method of the Study

In this study, a method of context assessment was used. It allowed to have a descriptive study of the breathing profile in children who bear the DS.

#### Universe

This research universe was compound of a Group Census composed of seven 4-to-10-year-old children of both sexes who bear the DS and live in Gurupi/TO.

### RESEARCH ETHICS

This research project was submitted to the Research Ethics Committee involving Human Beings of the Castelo Branco University (UCB/RJ) and approved under the protocol number 0167/2008.

The data collection happened according to the Resolution 196/96. Thus, initially, for the study to be developed the parents' or tutor's permission was required through a Clearing and Free Permission Form. An explanation letter was annexed to it telling the nature of the study.

#### Assessment Procedure

To ensure the execution of this study the following evaluation protocol was used:

##### 1. Protocol of Breathing Assessment By Ferraz

This protocol was used to evaluate breathing in the following factors: face abnormal posture; upper arcade of the palate and the nostril narrowing; hypotonic short and lifted lips; face muscles; hypotonic tongue with abnormal posture; impaired smell; breathing infections increase; ace type; chewing; speech; breathing; lip vibration; whistle; swallowing. Each item received a score of 0 to 5, but the item which evaluates the face muscle because it varies from 0 to 4. Each evaluated person had the opportunity to obtain a top score of 70 points.

#### Result Presentation and Discussion

The use of the Protocol of Breathing Assessment made it possible to obtain an average of 28,71 points, with a variation in the results between 19 and 35 points, where 85,71% of the individuals showed a score below the half of what would characterize the nose breathing. This evidenced the breathing totally through the mouth. Only 14,28% showed a result above 35 points, what means that, in his breathing, the mouth dominates the nose. After carrying out a statistical treatment through Test t (Table 1), a significant p-value <0,03 was found. This result proves, statistically, the mouth breathing of such individuals.

Table 1: Test t concerning the results of the Breathing Assessment Protocol

Sample size	7
Population average	28.7100
Sample Average	28.7143
Pattern Error	2.6611
(t)	0.0018
Freedom Degree	6
Power (0.05)	0.0379
Power (0.01)	-0.0845
IC 95% (sample average)	22.2025 to 35.2261
IC 99% (sample average)	18.8495 to 38.5791

Based on the results presented above it's possible to say that the children have difficulties in using the nose breathing because of some aspects inherent to this problem, like tonsil and/or adenoid hypertrophy, septal bypass, allergic rhinitis, sinusitis, smaller nose cavity, narrow nostrils; smell and taste alterations; teeth occlusion alterations; half-open lips are dry and flabby, and have color alterations; protrusive tongue; chewing alterations; swallowing alterations; voice alterations (nasal and/or hoarseness); frequent otitis; head and neck posture alteration; sleep alteration (snore, drool, day sleep); lower physical productivity, studies efficiency alterations; speech alterations (letter switch, limited articulation, imprecise and distorted articulation; drool excess) ((FERREIRA, 2008).

Thus, alterations due to the mouth breathing will be present in all the systems that intervene in switching gases with the environment, besides affecting the nutrition, the intellectual capacity and the sense organs.

According to the results, it's possible to conclude that the breathing profile in children who bear the DS shows the difficulty in keeping an adequate nose breathing, and these children become inclined to performing a mouth breathing, what brings risks of frequent breathing infections.

In addition, the mouth breathing can increase difficulties in motor development, such as walking impediments and motor coordination in general. Consequently, it impairs the physical productivity and learning which were already predicted for these children.

Their higher speed of growth happens during the first 10 years of life. It's necessary to provide them with better conditions so that this growth is as peaceful as possible.

It was concluded that these children need, urgently, to be submitted to a valuable program of intervention of physiotherapeutic nature to be assessed, planned, carried out to fulfill the lack, positively, especially of the segments involved in breathing, and also the health general state of these children. The objective is to improve functioning of the breathing system involved in this difficulty in performing the appropriate nose breathing.

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#### AN ASSESSMENT OF THE BREATHING PROFILE ON CHILDREN WHO BEAR THE DOWN'S SYNDROME

##### ABSTRACT

The Down's syndrome, which presents itself as a chromosomeopathy characterized by the additional presence of a chromosome in the 21st pair, causes a disturbance to the human body cell functions, making people who have this alteration present injury in their organic system and, thus, bigger sensitivity to some illnesses. Facing this problem, in this project, in which a method of a context assessment was used, the objective was to develop an assessment concerning the breathing profile in 4-to-10-year-old children who bear the Down's syndrome and live in Gurupi/TO. This research paper was submitted to the Research Ethics Committee involving Human Beings of the Castelo Branco University (Rio de Janeiro/Brazil) and approved under the protocol # 0167/2008. The data collection was done according to the resolution 196/96. The results evidenced that the group presents, predominantly, mouth breathing. Through the meaningful Test t, it was statistically proved that these people perform mouth breathing. It's concluded that they have a decrease of strength on the facial muscles because of an inherent hypotonicity. This makes it difficult for them to keep an appropriate nose breathing. Thus, the risk of breathing infections increase and this can lead them to death. Due to this, it's vital to have a physiotherapeutic intervention to have the strength and muscle system function back, especially the segments involved in breathing.

**KEY WORDS:** Assessment, breathing profile, Down's syndrome

#### UNE ÉVALUATION DU PROFIL RESPIRATOIRE DES ENFANTS AVEC LE SYNDROME DE DOWN

##### RÉSUMÉ

Le syndrome de Down peut être présenté comme une anomalie chromosomique caractérisée par la présence d'un chromosome supplémentaire dans la paire 21, provoque un déséquilibre dans les fonctions des cellules du corps humain, qui conduisent des personnes à cet amendement. Cet engagement de votre système et de l'organisme et donc une plus grande susceptibilité a être douloureux. Dans certaines de ces questions, cette recherche, qui a utilisé la méthode d'évaluation du contexte, l'objectif était de développer une évaluation sur le profil des voies respiratoires des enfants de 4 à 10 ans atteints du syndrome de Down, qui vivent dans la ville de Gurupi / TO. Ce projet de recherche a été soumis à l'éthique dans la recherche

impliquant des sujets humains à l'université du Château Blanc (RJ / Brésil) et a été approuvé sous le numéro de protocole 0167 / 2008 et la collecte des données a donné les résultats 196/96. La résolution montre que le groupe sera principalement présent dans la respiration buccale. Par le test T signifie l'importance, révélées statistiquement sur le profil de plusieurs individus. Il a été conclu qu'ils souffrent de réduction de force au niveau des muscles faciaux, d'une hypotonie et d'une fonction propre, leur permettant ainsi de maintenir un difficile chemin de respiration nasale adéquate. Augmentent le risque d'infections des voies respiratoires qui peut les conduire à la mort. Nécessitant d'une intervention thérapeutique physique pour la réhabilitation de la force et de la fonction du système musculaire, en particulier les segments impliqués dans la respiration.

**MOTS-CLÉS:** évaluation, profil respiratoire, syndrome de Down

#### **UNA EVALUACIÓN DE PERFIL RESPIRATORIA EN NIÑOS CON SÍNDROME DE DOWN SÍNDROME DE DOWN RESUMEN**

Para ser presentado como una anomalía cromosómica se caracteriza por la presencia de un cromosoma adicional en el par 21 provoca un desequilibrio en las funciones de las células del cuerpo humano, haciendo que los individuos Esta enmienda tiene el compromiso de su sistema corporal y por lo tanto una mayor susceptibilidad a enfermedades. Diante algunas de estas cuestiones, esta investigación, que utiliza el método de evaluación de contexto, el objetivo era desarrollar una evaluación sobre el perfil de las vías respiratorias de los niños 4 a 10 años con síndrome de Down, que vive en la ciudad de Gurupi / TO. Este proyecto de investigación fue presentado a la ética en la investigación con sujetos humanos en el Castillo Blanco de la Universidad (Río de Janeiro / Brasil) y aprobado con el número de protocolo 0167 / 2008 y la recopilación de datos se da como 196/96. Os resultados mostraron que el grupo predominante respiración bucal. pelo prueba t de importancia, ha resultado ser estadísticamente el perfil de individuo a verbal. Se concluyó que sufren reducir la fuerza de los músculos faciales función hipotonía y los poseen, que les permita mantener un difícil camino adecuada. Desta la respiración nasal, aumentan el riesgo de infecciones respiratorias que pueden conducir a la muerte, que torna imprescindible uma intervenção fisioterapêutica para reabilitar e força e a função do sistema muscular, em particular dos segmentos envolvidos na respiração.

**PALABRAS CLAVE:** Evaluación, el síndrome, respiratorio, perfil

#### **UMA AVALIAÇÃO DO PERFIL RESPIRATÓRIO DE CRIANÇAS COM SÍNDROME DE DOWN RESUMO**

A síndrome de Down, por se apresentar como uma cromossomopatia caracterizada pela presença adicional de um cromossomo no par 21 provoca um desequilíbrio nas funções das células do corpo humano, fazendo com que os indivíduos com esta alteração apresentem comprometimento em seu sistema orgânico e, assim, maior suscetibilidade a algumas doenças. Diante dessa problemática, nesta pesquisa, na qual foi utilizado o método de uma avaliação de contexto, se teve como objetivo desenvolver uma avaliação acerca do perfil respiratório de crianças de 4 a 10 anos, com síndrome de Down, residentes na cidade de Gurupi/TO. O projeto desta pesquisa foi submetido ao Comitê de Ética em Pesquisa envolvendo Seres Humanos da Universidade Castelo Branco (Rio Janeiro/Brasil) e aprovado sob protocolo nº 0167/2008, tendo a coleta de dados se dado conforme a resolução 196/96. Os resultados evidenciaram que o grupo apresenta, predominantemente, a respiração bucal. Pelo Teste t, de significância, comprovou-se estatisticamente o perfil bucal de tais indivíduos. Concluiu-se que estas sofrem redução da força da musculatura facial em função da hipotonia que lhes é própria, o que lhes dificulta manter uma respiração nasal adequada. Desta forma, aumentam os riscos de infecções respiratórias que podem levá-las a óbito, o que torna imprescindível uma intervenção fisioterapêutica para reabilitar a força e a função do sistema muscular, em particular dos segmentos envolvidos na respiração.

**DESCRITORES:** Avaliação, perfil respiratório, síndrome de Down

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