TITLE PAGE

New Therapeutical Perspectives in Cases of Phonological Disorders

28053914.1.0000.5346

DOCUMENT DATE: 20/11/2018

STUDY PROTOCOL WITH SAP- STATISTICAL ANALYSIS PLAN

Objectives: The objective of this research was to analyze and compare phonological aspects such as phonetic inventory, phonological system, severity of the speech sound disorders, altered distinctive traits and phonological processes, as well as phonological and phonoarticulatory awareness, besides the auditory aspects of the abilities and variables present in Long Auditory Evoked Potential Long. Comparisons of the phonological and auditory aspects were performed before and after the intensive period of treatment in children with speech sound disorders. Twenty-five therapy sessions were assigned. The children were randomly drawn among three groups. Group 1 - Placebo: This group received no specific treatment for speech deviations, only used the computer resource to play on a website. The Group 2-Cycles Traditional: the therapy used the Modified Cycles Model. And the Group 3-SIFALA ("Speech Intervention Software"): the therapy used the proposal of the Strata Model based on Stimulability and Segment Complexity that was developed in software format. The categorization of these groups obeys the methodological questions of a randomized clinical trial. The evaluation of the children and the treatment of one of the SIFALA group were carried out by the responsible researcher. The other two groups were treated by fellowship academics of the Speech Language Pathology program. The reassessment of all procedures was performed by speech language pathologists with experience in speech and hearing areas who did not have knowledge about the variables of the research, so it was categorized as a single-blind trial. After the treatment period, the data were compared by means of the statistical analysis that used as a criterion to estimate the effects in each therapy group using the linear regression model with mixed effects for the quantitative variables responses. Also

was used the polytomic logistic model for ordinal qualitative variables. In addition, Chi-Square and Wilcoxon tests were used for analysis of the abilities and variables of Long Auditory Evoked Potential. A significance level of 0.05 was set for all tests. Most of the children treated presented gains in the phonological and auditory variables. The therapeutic models used fulfilled the objective of reorganization of the phonological system, being possible to point out as innovative and differentiated the model using *software*-SIFALA. Key Words: Children. Language. Speech Sound Disorders. Auditory Perception. Rehabilitation of Speech Sound Disorders.

STATISTICAL ANALYSIS PLAN

The variables chosen for the static analyzes characterize the phonological and auditory aspects of the evaluations applied before and after the treatment period. For the phonological aspects, we adopted the variables that determine the phonological system, dividing sounds by the following criteria: acquired, partially acquired and not acquired; (SHRIBERG et al., 1997), altered distinctive traits and phonological processes. The PCFO (SEABRA and CAPOVILLA, 2012) and the evaluation of phonoarticulator awareness – CONFIART (SANTOS, VIEIRA and VIDOR-SOUZA, 2014) were also analyzed. For the auditory aspects of the LAEP, the variables were the measures of latency and amplitude of the right and left ears, as well as the qualitative description of the occurrence of the P300 wave. The main statistical method used as a criterion for estimating the effects in each therapy group was the linear regression model with mixed effects (FAUSTO et al., 2008; PINHEIRO et al., 2017) for the quantitative response variables. This model uses fixed effect for the therapy group and random effects for children in the treatment periods, extracting information from the data more accurately than the traditional linear models, which usually use only fixed effects for the explanatory

variables. The main inferential utility of the linear regression model is related to the interpretation of the significant coefficients, with which it is possible to have an estimate for the change in the level of the phonological aspects considered in the research, among them: phonetic inventory, phonological system, distinctive features and phonological processes. The polytomic logistic model was also used for the variables of ordinal qualitative responses, which included the analysis of PCFO performance (SEABRA and CAPOVILLA, 2012) and the evaluation of phonoarticulatory awareness. (SANTOS, VIEIRA and VIDOR-SOUZA, 2014).The advantage of the application of logistic models is mainly the determination of the odds factor through the exponentiation of the estimated coefficients. Other tests involved in validating the results include Fisher's Exact, ShaphiroWilk and Levene T for correlated samples and Analysis of Variance. Chi-Square and Wilcoxon tests were applied to the PEALL variables. For all hypothesis tests, a significance level of 0.05 was set.