

EVALUATION OF THE EFFECTIVENESS OF THE LISTENING TRAINING  
FOR PATIENTS WITH LISTENING ATTENTION DEFICIT CO-OCCURRING  
WITH AUDITORY PROCESSING DISORDERS

## Abstract

Hearing is a sense, which has a significant impact on a child's development. Disorders connected with hearing can have impact in a various forms and affect each area of life.

Hearing disorders may concern peripheral auditory system as well as its parts responsible for central processing , which the topic of the dissertation. It is estimated that central auditory processing disorders in its isolated form concern 2-3% of the population of school-age children, however, the problem co-occurring with other disorders may affect even several dozen percents of children. According to the available recommendations, there are three main therapeutic approaches in the treatment of patients with auditory processing disorders: transforming the school environment, teaching the child strategies how to compensate his or her difficulties or using hearing trainings focused on a specific deficit.

The main purpose of this dissertation was to evaluate the effectiveness of the auditory training for patients with listening attention deficit co-occurring with auditory processing disorder. Two additional specific objectives were also formulated:

1. The assessment of sex, age and general intelligence factor of patients in the translation into the effect of the therapy performed by them.
2. Evaluation of the effects of therapy in distant measurement: 6-12 months after the end of the therapy.

The materials of the work represent the results of 173 patients in the age of 6 to 19 years old ( $M=9,93$ ;  $SD=2,64$ ), including 99 boys and 74 girls. 143 patients constitute a study group that has undergone specially developed auditory training for patients with listening attention deficit co-occurring with auditory processing disorder. 30 patients constitute a control group. All persons from the study group had the following tests carried out assessing auditory processing

processes as a part of rehabilitation, in accordance with the developed diagnostic and rehabilitation procedure: Frequency Pattern Test, Duration Pattern Test, Dichotic Digit Test in binaural version and with focusing attention, Gap Detection Test, adaptive Speech in Noise Test, Dichotic Digit Test, Frequency Pattern Test as part of the Listening and Laterality Test and P300 test. The tests were performed before the beginning of therapy and three months after its completion. All 143 patients were invited for long-term follow-up visits, but ultimately 115 people showed up. Due to the organization and time-consumption P300 test, two measurements before and after therapy, was performed in 54 people.

The results of patients undergoing auditory training devoted for patients with listening attention deficit co-occurring with auditory processing disorder were analyzed in various aspects. The analysis involved the influence of the time factor between the measurement 1 and the measurement 2 in the test group in relation to the control group. The effect of therapy was evaluated on the basis of comparisons between the results of the measurement 1 and the measurement 2 in the study group and the analysis of the measurement 3 (assessing the distant effects of therapy) in relation to the two previous measurements. The sex, age and general intelligence factors were also analyzed in terms of the achieved effects of the therapy.

Analyzes of the results of patients in the study group showed significant effectiveness of the auditory training. There was significant improvement after the therapy in the study group.

Analyzes of the long-term results have shown that patients' results has not only stabilized but also improved in 7 out of 12 tests.

In terms of gender no differences were observed between the results of girls and boys in the tests evaluating auditory processing.

The age of patients proved to be a factor significantly differentiating patients' results. The most significant changes in the results were observed in age groups from 7 to 11 years old and older than 11 years old in comparison to the results of children under 7 years old. These conclusions are consistent with the data on the evaluation of auditory processing in younger children, which is below 6-7 years old.

Analyzes assessing the effects of the therapy in patients with different levels of intelligence showed the most significant changes in groups with above-average and average intelligence and next with very high intelligence. The fewest significant changes were observed in the group of patients with below-average intelligence.

Analysis of the results of patients with listening attention deficit co-occurring with auditory processing disorder after the therapy allowed to formulate the following conclusions:

1. The effectiveness of the developed rehabilitation method has been demonstrated. Changes in the post-therapy results were statistically better than pre-therapy results in all of the tests evaluating central auditory processing processes.
2. Gender is not a factor affecting the results of patients after the therapy, while the age and the level of patients' intelligence have an impact on the level of auditory processing processes, which translates into the effectiveness of the rehabilitation.
3. Long-term measurements carried out 6-12 months after the end of therapy showed continued therapy effects and even improved results.

The analysis of the issues related to the diagnostic and rehabilitation process of central auditory processing disorders allowed to formulate additional conclusions:

4. It is necessary to develop standardized set of tests evaluating auditory processing and its standardization.
5. Developing standardized set of tests to assess auditory processing would allow to assess the effectiveness of different therapies.
6. Due to the number of factors affecting the assessment of auditory processing its diagnostics should be done by an interdisciplinary team.