

**The Effectiveness Of The Bobath Neurodevelopmental Treatment  
And Halliwick Concept Hydrotherapy In The Treatment Of  
Children With Cerebral Palsy.**

**Study Protocol**

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A first group of 40 children was the main intervention team for both Bobath neurodevelopmental treatment on land, and the Halliwick concept – hydrotherapy in water, a session from each approach, weekly. This specific group is the one which was also used for the control of validity and reliability the water assessment test translations in Greek (WOTA 1, WOTA 2, SWIM, HAAR). A second group of 35 children, a control - intervention group 1 with the Bobath neurodevelopmental treatment on land, two sessions a week, was the standard of comparison and support of “reasonable” assumptions, in order to assess the hypothesis that Halliwick concept hydrotherapy, combined with the intervention on land leads to better therapeutic results. A third group, a control group 2 – without an intervention, consisting of 5 children, also with cerebral palsy, upon which we could additionally affirm some of our assumptions about children who do not receive any intervention. This group was small, because it is extremely difficult to have children with cerebral palsy who do not receive any intervention, either privately or in an institution, or in their special school.

In the process of implementation of the WOTA 1, WOTA 2, SWIM, HAAR, GMFM, PEDI, PBS, TUG in the groups of children, one of the authors - pediatric physiotherapist, hydrotherapist and two pediatric physiotherapists - hydrotherapists of the Center for Developmental Physiotherapy “Laboratory of Movement” have participated, distinguished for their many years of experience in the motor skill disorders of children with cerebral palsy. All application procedures and follow-up tests performed in the group of participants were recorded by one of the three examiners who did not participate in the test grading. The grading was performed by the other two examiners, separately, through the watching of the video footage tests, in order to eliminate the possibility of affecting the judgment of one examiner from the other.

All tests were performed at around the same morning hour and before the little patient’s participation in any rehabilitation program, for example, physiotherapy session, occupational therapy, speech therapy, hydrotherapy.

All tests were performed in the same site, in the same room of the “Laboratory of Movement” Developmental Physiotherapy Center, where the required equipment (mattresses, staircase, appropriate seat height, rods, toys, balls) was available. The equipment was arranged by the examiners, in order for the arrangement of the area to be the same during all measurements. Particular emphasis was placed on keeping the test area constantly at such a level, so that the child being tested is dressed with the least amount of clothing, so as not to make it difficult for it to perform the skills, and to be able to videotape the effort in the best possible way .

The assessment of the water intervention group took place in the same indoor heated swimming pool for all children, with a length of 8 meters, and a width of 4 meters and gradually increasing from 0.80 meters of the minimum depth to 1.50 meters of a greater depth. The water temperature was 32 ° C - 33 ° C during all measurements. The pool lighting was only external and the same for all the tests and

all children. No flotation aid was used. The children were dressed in their swimsuits, except for those that did not have a sphincter muscle control, who also used a special water diaper or a special swimsuit.

An attempt has been made to perform the tests without the presence of any other person (relatives, observers or other children) so as not to distract the children undergoing the tests. In order to perform all the tests, one of the two parents needed to be present, to ensure a sense of security, while at the same time, it was more attainable to achieve the best possible cooperation and performance of the child.

During the implementation of each evaluation test and during the grading, the instructions given by the authors in their manuals were closely followed by both evaluators. Oral explanations were given, but, in some cases, where the child's cognitive level required it, a representation was made of how the test was meant to be performed, by the examiner, toward the child. This was noted in the observations of the first examiner for each child, in order for the second examiner to follow the same instructions. Each child was given three chances to perform each test.