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**Original Research Article**

# The effect of comprehensive rehabilitation on correcting muscle imbalance in rural children from the Warmia and Mazury region

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**ABSTRACT**

**Introduction:** A complex problem concerning the disability of rural children stems from the specificity of a rural environment. Such an environment frequently serves as the source of negative stimuli, thus leading to muscle imbalances in children. Negative stimuli affecting personality, that children are exposed to sometimes for years, result in a local strain in a child's young organism, and then, commonly, in motor system dysfunctions. In this connection, muscle imbalance develops; whereas muscle balance conditions a correct body posture and appropriate functioning.

**Aim:** The aim of this study was to discover the sources of negative influences affecting a rural child's development and to design effective preventive measures. Consequently, the intended objective of the designed program was to provide professional rehabilitation for the largest number of children and youth having motor system dysfunctions as well as emotional disorders. Another goal of this program was to determine the effect of comprehensive rehabilitation on correcting muscle imbalance in rural children.

**Materials and methods:** This study comprised 50 children (30 girls and 20 boys) participating in a rehabilitation course designed for rural children as a three-week program. Children were examined by employing a specially devised chart of examinations and procedures in order to analyze and evaluate their functional problems in detail.

**Results and discussion:** A comprehensive rehabilitation program implemented by a team of therapists was in many cases beneficial with respect to rehabilitation outcomes: the restoration of muscle balance generated a decrease in or disappearance of the functional problem. Such improvement mostly involved children diagnosed with a shortened lower extremity, kyphosis (round back), winged scapula, or a low-grade functional scoliosis.

**Conclusions:** Examination results indicate that comprehensive therapy is required. Combining physical rehabilitation with psychotherapy eliminates the sources of negative stimuli that lead to the appearance of or to the increase in the motor system dysfunction.

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A child's conscious involvement in the therapeutic process and work performed in the framework of autotherapy are also very important.

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## 1. Introduction

People with disabilities are regarded in the European Union as one of the social groups at risk for social exclusion. This is caused mostly due to negative social attitudes, difficult access to, e.g., public utility facilities, low levels of education and employment, insufficient support regarding education, and high additional costs connected with the disability.<sup>8,12,16,17,23,24</sup>

A large number of rural children with disabilities is particularly worrying. Disabled children from rural regions comprise 18% of the population. This results mostly from privation common to rural areas. Destitution contributes to a passive attitude towards one's fate and that of one's family. Basic problems concerning making one's living frequently veil the need to rehabilitate a child having a disability.<sup>9,14,17</sup>

In 2003, by the initiative of the Local Branch of the Agricultural Property Agency in Olsztyn, the Warmia and Mazury Branch of the Sovereign Military Order of Malta and the 103rd Military Hospital in Olsztyn, a rehabilitation program was designed for children of former employees of the state agriculture farms from the Warmia and Mazury Region.

## 2. Aim

The aim of this study was to discover the sources of negative influences affecting a rural child's development and to design effective preventive measures. Consequently, the intended objective of the designed program was to provide professional rehabilitation for the largest number of children and youth having motor system dysfunctions as well as emotional disorders. Another goal of this program was to determine the effect of comprehensive rehabilitation on correcting muscle imbalance in rural children.

## 3. Materials and methods

This study comprised 50 patients undergoing rehabilitation in the Rehabilitation Center at the 103rd Military Hospital in Olsztyn within the framework of the program named *Rehabilitation of children from post-state farms environments*. This program was implemented in the period of 2003–2007. Children qualified

for this study were heterogeneous with respect to dysfunctions, including congenital defects, postural defects and post-traumatic conditions. A separate control group was not designed. This decision was grounded in the assumption that each rural child qualified for this program should maximally benefit from comprehensive rehabilitation offered because all children required therapy and for many this was the only opportunity to participate in rehabilitative activities.

The study group consisted of 30 girls and 20 boys, aged 7 to 18 years old (average age 12 years). Children participated in three-week rehabilitation courses conducted in the Rehabilitation Center. During these courses, children underwent complex rehabilitation designed according to their individual needs. They also participated in psychotherapy sessions and educational classes, as well as enjoyed recreational activities.

In order to conduct a comprehensive evaluation of each patient's condition, a chart of examinations and procedures was designed as well as a chart evaluating posture and a chart assessing static muscle balance according to Rakowska.<sup>16</sup> These charts were created with a view to provide the largest possible volume of information allowing researchers to analyze thoroughly the problems of each child qualified for a rehabilitation course.

Posture chart was mainly based on a visual evaluation; whereas a chart of examinations and procedures comprised detailed data such as: interview focused on those spheres of life that can have a negative impact on a child, functional disorders, gait analysis, functional examination, cause of dysfunction, therapeutic aim, devising an individual program, indications for further therapy, also at home.

A detailed examination assessing static muscle balance was an important stage when devising an individual therapeutic program for each child.<sup>16,17,19</sup>

The following muscles were examined and assessed: rectus femoris, iliopsoas, biceps femoris, adductors, piriformis, quadratus lumborum, gastrocnemius, levator scapulae, pectoral, rectus capitis muscles.

Imbalance observed in any of these muscles was an indication for designing a program of autotherapy in order to eliminate their contractures in the shortest possible time.

The program devised for a three-week rehabilitation course included: general exercises, individual exercises intended to restore muscle balance, therapy conducted according to

**Table 1 – The most frequent motor system dysfunctions in rural children.**

Sex	Dysfunction					
	Scoliosis	Valgus knee	Round back	Gait disorder	Poor physical efficiency	Multiple defects
Girls	16	8	18	12	8	24
Boys	12	6	16	9	6	14
Total	28	14	34	21	14	38

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