Inclusion of a girl with Down syndrome in general physical education focusing on selected physical activities, dancing, skiing and swimming

(scientific paper)

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Abstract: *Pupils with Down syndrome and other cognitive and physical disabilities are usually educated in special schools in the Slovak Republic. The paper presents the qualitative research results of including a girl with Down syndrome in general physical education classes. This experience of empowering and supporting diverse academic and/or social learning among pupils of all abilities is called inclusive education. The authors depict the potency of the selected physical activities, gymnastics, elementary dancing and rhythmic activities, skiing, and swimming on a girl with DS. The focus is chiefly on the factors affecting her health status and motor skills. The potency of the intervention was proven in all the spheres of girl's development, health, mental, social and emotional.*

Keywords: *Down syndrome, inclusion into Physical education, spheres of health development*

1 Introduction

Although Down syndrome (DS) is a disability, not illness, it can still be described as "Down illness" or "Morbus Down". These appellations are out-dated and they do not describe the diagnosis itself. DS is a genetic condition that leads to a broad range of cognitive and physical developmental delays. In children with DS there are also present delays in motor development, because the reduced size of the cerebrum, brain maturation disorders, and pathophysiological processes lead to motor development delay. In DS there were described more than 120 characteristic symptoms, but in the majority of children with DS only 6 or 7 are present. They can vary to a great extent in terms of ability, but have certain physical features in common. Approximately half of them have heart defects or hearing difficulties due to differences in ear structure

(Selikowitz, 2005). According to Delacruz and Gerald (In Capkova et al., 2014) chromosome 21 is the smallest human chromosome that includes approximately 1.4 % of the total human genomic length. Trisomy 21 is the main abnormality associated with this chromosome and is the commonest genetic cause of mental retardation, which affects 1.3 per 1000 live births. DS can be associated with the following physical features: small head, ears of unusual shape and structure, upward slanting eyes, and celiac disease.

The most common disorder in children with DS is their disability to concentrate and conduct, emotional and motor deceleration, and low muscle tone (hypotonia) that negatively affects fine and gross motor skills. Motor development is very important as it encourages perception, speech comprehension and higher forms of intellectual functions. Children with DS have the following strengths, they are hardworking, persistent, friendly, kind, and generous, they are able to get along with others they like to play, run and be a part of collective. These positives enable them to be successfully included in general education by following the particularities of DS while at the same time, teachers should be tolerant, understanding, creative, able to support and help them. The following methods are largely used in the Slovak Republic for the treatment of physical and mental impairment in children with DS Vojta method, Bobath approach and regulation therapy by Castillo-Morales, and Feuerstein method. Physical activity is in general one of the key factors of building healthy lifestyle. The inclusion of physical activity into daily routine affects disabled and intact children's physical and mental health.

The authors of the paper present the selected qualitative research results of an inclusion of a girl with DS in general physical education classes. There was proven potency of gymnastics, games, elementary dance with rhythmic activities, skiing and swimming on her health status and motor skills.

2 Theoretical background on the inclusion of a child with Down syndrome in general physical education classes

Currently, the education of pupils with special educational needs in general education school classes, is addressed in the Act 245/2007 Coll. on education (School Act) from May 22nd, 2008, and on modification and replenishment of some laws. According to this document school integration is *"education of children and pupils with special educational needs into school classes designated for children or pupils without special educational needs"* (article 1, § 2, par. s). The main aim of this integration is successful socialisation and acceptance of a human being, the success of which depends on educator's tolerance, support, creativity and help. An individually integrated pupil

may be educated in general education schools or in special schools established for pupils with specific cognitive or physical disabilities. For an individually integrated pupil is developed an individual educational plan.

Beside the 'integration' there is the possibility of 'inclusion'. Although these terms are being mixed by some authors there is a difference in meaning. According to Mittler (In Lechta, 2010) an **integrated** child should be prepared for his or her integration into educational institution while at the same time he or she should adapt to an institution's conditions. On the other hand, social inclusion is, in Mittler's opinion (ibid.), based on the acceptance of diversity in terms of gender, nationality, race, language of origin, social background, and on the level of individual's disability or performance. This way of welcoming, empowering, supporting and valuing diverse academic and social learning among pupils of all abilities is so called **inclusive education**.

However, when the children with DS are tolerated by major community, so called intact individuals, from their side it is more a certain form of integration than inclusive trend. In this respect this can be considered hidden social discrimination. Požár (In Jesenský, 2000) in similar situations recommends realising co-adaptation trend whereby there should start the relationship of partnership among the majority group (intact children) and minority group (children with DS or other disabilities), in which there can be formed new values by the penetration of values from both groups. Sande (In Lechta, 2010) mentions the inter-stage between integration and inclusion so called **co-operation** between institutions on a partnership basis.

Successful learning process is preceded by early child care under the guidance of following experts: special education teachers, psychologists, paediatricians, speech therapists, physiotherapists and social workers. Compulsory school attendance may be completed at a special elementary school according to three various variants of curricula. After its graduation the children can enter vocational or practical school. However, increasingly common form of education is the integration of the child in the general elementary school which might result from the fact that the abilities of a child with DS enable him or her for the integration. Their integration is thus highly recommended, especially given the fact that children with DS can learn especially by imitation (Šustrová, 2004).

Carefully selected **physical activities** are in general considered favourable conditions for full and harmonious development of child´s personality. They are used for the maintenance of healthy physical development and have psycho-regulation effect. They have the function of active relaxation, increase resistance to disease, stress and contribute to the overall mental balance and psychological well-being. This effect can be found both, in disabled and intact children who live a healthy lifestyle and engage in regular physical activity. Their other benefit is social effect resulting

from positive experiences from performing sport in a group of children and from developing new relationships.

Elementary dancing can be used as a form of therapy for its positive impact on human emotions. As a form of therapy dancing began to be used since 1940 to improve mental and physical health. Curricula of physical education for disabled students, that are valid in the European Union, describe movement therapy as the therapy where dancing of an individual can be integrated in the process supporting his or her emotional, cognitive, physical and social integration (Van Coppenolle et al., in Cavill et al., 2001). Králová (2015) claims that every song or composition has its specific mood, thus it can form an individual not only from physical, but also from affective and moral aspect. And moreover, dancing persons can experience pleasure and satisfaction in pleasant atmosphere of music.

The need for natural movement is very strong in young children, but it is reduced in older children and naturally reduces the amount of physical activity performed (Chovanová, 2013). In children with DS the need to move remains for longer time. Bendíková (2009) claims that liberalisation of the curriculum of school subject Physical education (PE) places an increased demand on a PE teacher especially when they select new and modern physical activities. Among conditions for effective teaching process, creative-oriented methods can be used. They are oriented towards experience, emotionality, relationship of every pupil to physical activity. By means of them physical education can support emotional, intellectual and aesthetical personality development, formation of creativity which leads to healthy lifestyle of pupils.

3 Methodology

The conclusions presented in this paper are based on the study mapping the education of children with DS included in a general physical education (PE) classes. In the study we used a quality-based methodology (content analysis of pedagogical and psychological documentation and observation); performed the interview with the girl´s mother and evaluated the results of physical tests.

The **objective** of our intervention was to develop and evaluate the set of exercises and physical activities for a girl with DS included into general PE classes with intact children. The intervention programme was carried out at a rural elementary school in central Slovakia.

The basis of non-standardised test was a test battery *Unifittest 6–60* which is described in detail by Vrbas (2006). After the processing and assessment of pre-testing (observation and interview), we developed an exercise programme of elementary gymnastics, movement games and rhythmic activities, elementary dancing, exercises

with a fit ball and mats, swimming and skiing. By pre-test (interview and observation) we wanted to evaluate the relationship of a girl with DS towards physical activity and movement. In the beginning of three year intervention she was in the 5th grade of elementary school. Based on aforementioned we selected the appropriate thematic areas that were interesting for her. We were in contact with her mother who constantly informed us of her daughter's health status and feelings during physical education classes.

The data analysis of performance pre-tests had indicated that the girl could be successfully included in general physical education classes at elementary school. Considering that at the rural elementary school there were also other children with DS, we selected and prepared the most appropriate exercises, games and sports that could be used for children with similar disability. We developed intervention programme for each class, especially designated for disabled pupils with DS and associated health problems.

3.1 Intervention programme

The intervention programme during physical education classes for a girl with DS consisted of the selected physical exercises, movement games and rhythmic activities, a few elementary dances realised during physical education classes, and of swimming and skiing during training courses. During elementary gymnastic exercises and selected physical exercises there was used thoroughly selected background music that was acceptable and pleasant for the girl.

A few days before the intervention started in the school year 2010/2011 we realised pre-testing. The girl was in 5th grade and pre-tests were aimed to evaluate her movement skills. Her mother was present during testing. The results were gained in the years from 2011 to 2013 and are demonstrated in the table 1.

During the intervention the elementary school had a subsidy of 3 classes of physical education (PE) per week, 99 classes per school year. The girl with DS was engaged in physical education with another two classes, which increased PE classes to 7 classes per week. She was taught the other school subjects according to the curriculum for special elementary schools. Therefore it was possible to increase the subsidy of physical education classes for her. Her mother was present in every physical education class. Despite the fact that the girl was present at all PE lessons, she could perform the physical activities from some thematic units that were selected and prepared exclusively for her.

Within physical education the girl was involved in chasing games, relay races, hitting the target, various games and rhythmic activities, and elementary dancing developing orientation and co-ordination skills, jumping and crawling in various

climatic conditions, for example in water, snow, or gym. She was involved in individual swimming course (10 hours per week) and ski educational courses. Since 2010 the girl participated in three ski courses which were realised in winter of 2010/2011, 2011/2012 and 2012/2013. Her mother and physician were present during these courses, and the girl acquired elementary ski skills. Since then she goes regularly skiing in the mountains and every year participates in school ski courses. She also owns skiing equipment and skiing outfit. The post-tests in the table 2 map the period of three school years from 2010 to 2013.

4 Results

The results shown in the tables 1 and 2 should be understood within the context of related facts as informative and initial, with respect to the inclusion of a child with DS in general PE classes. From the data characterising the investigated girl, we selected the ones that refer to the specified objective.

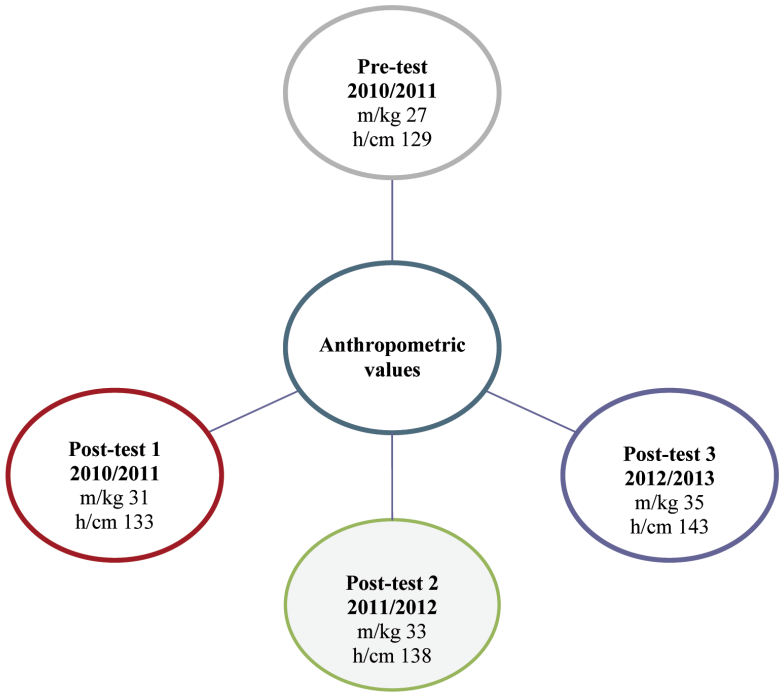
The results of the first mapped area, elementary motor skills, are shown in the table 1.

Table 1. Results of Elementary Motor Skills

Discipline	Pre-test 2010/2011	Post-test 1 2010/2011	Post-test 2 2011/2012	Post-test 3 2012/2013
Depth of forward bend (cm)	–11	–6	+1	+5
Sitting / prone position	7	13	16	17
Hitting the ball in circle with Ø 1 m	1	3	6	8
Standing on one leg / sec.	0	1	5	7
Swinging on fit ball (into fall/sec.)	8	15	35	42
Push ups / repetitions	2	6	9	9
Squat, knee-bend / endurance	2	7	14	15
Testing running 4 × 20 m / sec.	65	51	36	27
Passing a ball in pairs	2	5	11	15

The results of the second mapped area, anthropometric values, are shown in the table 2.

Table 2. Anthropometric values



The measured values indicate that motor abilities of the girl with DS improved after the intervention. Significant improvement of movement skills was reached in gymnastics, movement games and rhythmic activities and elementary dances developed for her, in swimming and skiing. The girl further improved her running technique and her muscle tone was increased. Children with DS are characterised with excessive weight in childhood, however, the girl did not put up on weight due to regular physical activity during PE classes and in her free time.

During the inclusion in general PE classes, the girl gained new movement skills in swimming and skiing, the quality of which do not reach even healthy children. By means of movement activities the quality of movement improved in the girl – her gait was smoother and more coordinated. We consider aforementioned a success, because almost every discussion of motor development in children with DS deals with hypotonia (poor muscle tone) and lax ligaments which are considered obstacle for their motor delays. Jobling (1999) indicates in his study of the motor skills of 81 teenagers, that balance and strength is a particular difficulty and remains to be a

weakness in teenage years. He found out that children with lower mental ages tended to have lower motor skill scores. This is probably the reason why young individuals with DS can ride a bicycle or a tricycle with difficulty. However, this was not proven in our girl after 3 year intervention, because currently she has been very competent on her tricycle. Her mother said: (…) we bought our daughter a tricycle. Now she is able to master 5 km without problems (…)".

There were proven also social benefits of the intervention, as the girl enjoyed sporting and recreational activities with other "intact" children who, on the other hand, learned how to respect and accept their disabled schoolmate as a part of their class. This kind of empathy was evident especially during skiing and dancing.

During three year intervention programme we did not have accident, nor damage of the girl's health status. This fact is a feedback for us, that the exercises developed for her were selected and prepared correctly. Thus we believe that they contributed to higher quality of educational process during general PE classes where the girl with DS was included.

The girl's mother evaluated the inclusion into general PE classes as follows: "(…) my daughter started attending general PE classes in the 5th grade. The inclusive physical education programme was developed exclusively for her by her new class teacher. (…) Even if the beginning was quite tough experience, her classmates gradually got accustomed to their new, somewhat 'different' classmate. (…) Her health status improved in a significant way after three years of regular exercising, the benefits of which can be seen on her gait and overall posture. She is able to walk up the stairs without support what was previously impossible for her. Her balance is much better and frequent falls on the ground are already past experience, I hope. Her improved health status was surprising even for daughter's neurologist. She was slim and in a very good condition. On the other hand other children with DS that we knew were relatively obese and clumsy. (…) In the 5th grade we planned sledging during educational ski course with her PE teacher. However, her orthopaedist approved swimming, skiing and cycling. She went there with borrowed skiing equipment and outfit. She especially enjoyed slow downhill skiing, but braking was a bit problem for her. Now we have own skiing equipment, outfit and go skiing in our free time. This year (2013) she was able to use a ski lift and braking was not a problem for her. She managed skiing on gentle slopes. (…) She also attended swimming educational course. In the beginning she used lifebuoy, and later on she managed swimming without support. She enjoys swimming and is not afraid of deep water. After the inclusion of my daughter into general PE classes I am sure it was a good decision. Everybody should move, whether healthy or handicapped. There are always exercises appropriate for everybody. (…) And dancing has always been so refreshing for her. Her classmates were kind and thus she could easily made friends. From the beginning she was quite nervous and repressed stress. Later on she improved her confidence

and managed her tension. I think that through dancing she was able to express her own feelings in another way and without hurting other children. (…) Currently my daughter enjoys good health and is satisfied. Even if she sometimes does not want to go to school to learn reading, writing, maths, she is always ready to go there because of PE lessons. When she comes across her PE teacher, she gives him a hug and says: the 4th lesson is PE. (…) In daily life she is more self-reliant, and I think it is a consequence of easier manipulation of her fingers and hands. (…) I also noticed that she does not repress her anxiety and other negative emotions so often as before. Sometimes she is able to find her own ways to express her negative or positive feelings."

5 Discussion

The objective of our intervention was to develop a set of exercises and movement activities for an inclusion of a girl with DS into general PE lessons. The results indicate that the intervention programme contributed to a significant improvement of the girl´s movement skills, especially in gymnastics, swimming and skiing. Later on her running technique was improved, her gait was smoother and more coordinated and her muscle tone was increased.

The most significant results were proven in the following:

- Motor skills and abilities of a girl were improved during her inclusion into general PE classes.
- The results of elementary motor skills indicate improvement of gross motor skills including sitting, walking, running and climbing stairs and fine motor skills helped her in self-service activities at school and in ordinary life (finer manipulation of fingers and hands).
- Improved health status – she is slim and in a good physical condition, because she practises recreational physical activities (cycling, walking, swimming and skiing) in her free time.
- Improvement of overall mental health, state of mind and outlook on life and satisfaction (spending her free time in a meaningful way).
- Successful inclusion of a girl with DS in a group of intact children. The selected and developed physical activities induced positive perception of others, including her self-perception.

These findings are supported by the following research studies. Cowley et al. (2010) claim that fitness exercises aimed at increasing the amount of low intensity physical activity in individuals with DS contributed to the improvement of their confidence and energy and made them feel good. The improvement in gross motor skills and

cognitive abilities after the intervention with physical activity respondents in 10–14 year old children with DS was proven in the research of Alesi et al. (2014) and Fernhall et al. (1989). Mendonca et al. (2011) proved positive potency of fitness programme and workout on gross motor skills, increasing the load support capacity and physical functions of limbs and fine bones in individuals with DS.

6 Conclusion

The paper presents the conclusions of a quality-based research performed in Slovak school. The objective was to develop and evaluate the set of exercises and physical activities for a girl with DS after her inclusion into general PE classes with intact children. She benefited from them in all the spheres of her development, health, mental, social and emotional.

As she practised recreational physical activities such as cycling a tricycle, swimming, walking and skiing, even in her free time, the girl´s health status and motor skills were affected in a positive way. The potency of the intervention was proven in the following:

- Motor skills and abilities:
  a) Gross motor skills: walking – her gait was smoother and more coordinated, her running technique improved, and she was able to climb the stairs without support after her muscle tone was increased.
  b) Fine motor skills: better manipulation of fingers and hands in self-service activities.
- Improved health status – she is not overweight and is in a good physical condition. She practises recreational physical activities in her free time such as cycling a tricycle, swimming, walking and skiing.
- Improved mental health, and life satisfaction.
- Better perception of her classmates.

Project affiliation: The text "Inclusion of a girl with Down syndrome in general physical education focusing on selected physical activities, dancing, skiing and swimming" has been researched as a part of the grant task VEGA no 1/0769/13 called "The efficacy of particular movement re-educational approaches aimed at correction of hyperkinetic disorders in children of younger school age".

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Documents

[16] Zákon č. 245/2008 z 22. mája 2008 o výchove a vzdelávaní (školský zákon) a o zmene a doplnení niektorých zákonov, čl. 1, § 2 odstavec s.

(reviewed twice)

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