

ANALYSIS OF THE QUALITY CHILDREN'S PLAYGROUNDS TO BE USED FOR LEARNING BASIC GYMNASTIC CONTENT

Kamenka Živčić Marković, Lucija Milčić and Dan Lanc

Faculty of Kinesiology, University of Zagreb, Croatia

Abstract

The aim of this study is to assess the quality of children's playgrounds in the neighbourhood Trnje in Zagreb with reference to the possibilities of use in implementing certain gymnastics topics, as well as a part of curriculum of Physical education in primary school classes. The study was conducted on 43 children's playgrounds. Analysis of quality of playground equipment on playgrounds was performed using two criteria: safety and usability. Results showed different levels of quality of individual equipment but, considering their safety, it can be concluded that the possibility of realization of gymnastic topics on children playgrounds is possible, considering the prescribed curriculum of Physical education in primary school classes.

Key words: playgrounds, artistic gymnastics, playground equipment, teaching curriculum, lower primary school

Introduction

Children's playground is defined as open space equipped with the necessary equipment that is intended for recreation and sports for children and youth (ACT Government, 2008, Wikipedia, 2008). They are usually located in the vicinity of pre-schools and schools, in parks, and in particular, designated open spaces. Nowadays, they are increasingly more present in indoor areas of commercial and sales centers in the form of playrooms and sports and recreation centers in the areas of local communities. Playgrounds, regardless of type and purpose, must be designed to ensure smooth and safe play (Kramarić, Kiš, Švagelj, 2008). Modern playgrounds contain equipment such as seesaws, toboggans, swings, climbing frames, sandstone, carousels, hanging bars and the like. Apparatus and equipment for playgrounds help children in developing fitness levels or the development of basic motor skills such as coordination, balance and basic forms of strength. Some researches (Badić et al., 2012, Bučar Pajek et al., 2010, Turšić, 2007) have shown that in some schools there is a lack of equipment for successful implementation of the curriculum of Physical Education, planned topics and artistic gymnastics, especially from a group of heights and stronghold at the apparatus. In schools that possess the necessary equipment, it is usually outdated and therefore unsafe for implementation in the process of education. Close to a large number of schools, there are specially decorated children's playgrounds, as well as individual apparatus, which can partly replace the existing deficiencies in equipment in some schools. For this reason, it can be assumed that the basic topics of artistic gymnastics can be partially or fully implemented in the open air playgrounds.

Therefore, the aim of this study is to assess the quality of children's playgrounds in the neighbourhood Trnje in Zagreb with reference to the possibility for use in the implementation of some topics in artistic gymnastics, as well as part of the curriculum of Physical Education in primary school classes.

Methods

The sample of examinees consisted of 43 children's playgrounds in the area neighbourhood Trnje - Zagreb. Trnje encompasses 7.365 km² in the southern part of central area in Zagreb, with a permanent population of 42,282 (according to the census from 2011th year), and with eight primary schools. Data collection on the safety and quality of children's playgrounds and equipment was carried out in the form of a questionnaire "Criteria for assessing the quality of children's playgrounds" (Čuk et al., 2007). Data collection was performed on: a combined apparatus, swings, hanging bars, apparatus for balance and hung, toboggans, carousel and playgrounds in full, taking into consideration their security and usability. Quality and safety are evaluated on Likert scale of 1 to 5.

For evaluation purposes of quality of the apparatus in individual children's playground, an analysis of the basic descriptive indicators was performed. The connection between safety and quality of individual apparatus on playgrounds was calculated with Pearson's correlation coefficient, in order to establish the statistical significance analysis of variance for independent samples with significance $p < 0.05$ was performed.

Results

Table 1: Descriptive parameters characteristic for children’s playgrounds

| Elements | N | Min. | Max. | Mean | SD |
|-----------------------------|----|------|------|------|------|
| Substrate between apparatus | 44 | 1,00 | 5,00 | 3,88 | 1,61 |
| Fence | 43 | 1,00 | 5,00 | 2,48 | 1,79 |
| Possibility of traffic | 44 | 1,00 | 5,00 | 3,31 | 1,11 |
| Age usability | 43 | 1,00 | 5,00 | 4,32 | 0,24 |
| Swings | 40 | 1,00 | 5,00 | 1,87 | 1,41 |
| Balance apparatus | 17 | 1,00 | 5,00 | 3,70 | 1,21 |
| Combined apparatus | 15 | 3,00 | 5,00 | 4,06 | 1,03 |
| Toboggan | 30 | 3,00 | 5,00 | 4,06 | 1,01 |
| Climbing frames | 33 | 1,00 | 5,00 | 3,66 | 1,19 |
| Apparatus for hanging | 8 | 3,00 | 5,00 | 3,50 | ,92 |
| Carousel | 31 | 1,00 | 5,00 | 2,22 | 1,33 |
| Toilet | 43 | 1,00 | 5,00 | 1,69 | 1,50 |
| Garbage removal | 44 | 1,00 | 5,00 | 3,11 | 1,40 |
| Glass | 44 | 1,00 | 5,00 | 1,40 | 1,18 |
| Benches and tables | 44 | 1,00 | 5,00 | 3,54 | 1,24 |
| Food and Beverage | 43 | 1,00 | 5,00 | 1,65 | 1,49 |
| Parking 1. | 43 | 1,00 | 5,00 | 3,76 | 1,64 |
| Parking 2. | 44 | 1,00 | 1,00 | 1,00 | ,00 |

Results of descriptive indicators of characteristics (Table 1) show that most of the playgrounds use adequate surface under and around the apparatus (Mean = 3.88). Their security is low because they are generally not fenced (Mean = 2.48), and, in terms of accessibility, bicycles are mostly allowed as means of transportation on playground surfaces (Mean = 3.31). Their usage in consideration with children age shows that they are mainly usable (Mean=4,32) for all age groups (0-3; 4-6 and 7-11age). Results of general characteristics of the swings indicate that they are in the worst condition of all playground apparatus (Mean=1,87). The following are carousels (Mean=2,22), and, in somewhat better conditions are hanging apparatus (Mean=3,50), climbing frames (Mean=3,66) and balance apparatus (Mean=3,70). Best characteristics were obtained by analyzing the quality of the combined apparatus (Mean=4,06) and toboggans (Mean=4,06). Assessment of the presence of toilets on playgrounds in most cases showed that they there are no toilets (Mean=1,69). Garbage disposal near children’s playgrounds is typically conducted once a week, but there exists a tendency of its conduction several times in a week (Mean=3,11), while specially marked garbage dumps for glass are rarely cleaned (Mean=1,40). There generally are benches and tables on children’s playgrounds, although, the tables are less frequent in their appearance (Mean=3,54). There are seldom restaurants, mostly they do not exist (Mean=1,65). Parking places in vicinity of children’s playgrounds mostly consist of marked parking lots with capacity for up to 10 cars (Mean=3,76), while parking for bikes and motorcycles is omitted (Mean=1,00).

Table 2: Correlation coefficient between safety and usage of apparatus

| Usage | Safety of swings | Safety of combined apparatus | Safety of climbing frames | Safety of balance apparatus | Safety of hanging apparatus | Safety of toboggans | Safety of roundabouts |
|-----------------------|------------------|------------------------------|---------------------------|-----------------------------|-----------------------------|---------------------|-----------------------|
| swings | ,640(**) | | | | | | |
| combined apparatus | | ,173 | | | | | |
| climbing frames | | | ,497(**) | | | | |
| balance apparatus | | | | ,303 | | | |
| apparatus for hanging | | | | | ,215 | | |
| toboggans | | | | | | ,380* | |
| carousel | | | | | | | ,281 |

** Correlation is significant at 0,01 * Correlation is significant at 0,05.

Correlation coefficients (table 2) indicate that there exists a statistically significant correlation ($p < 0,01$) between safety and usage of toboggans (,380), swings (,640) and climbing frames (,497) with significance $p < 0,05$. Combined apparatus, balance apparatus, apparatus for hanging and carousels did not show any statistically significant correlation between safety and their usage.

Table 3: Analysis of differences in the basics parameters of safety with regard to the type of apparatus

| Characteristic | Apparatus | N | M | SD | F | df | p |
|---------------------------|-----------------------|----|------|------|-------|------|------------|
| Substratum | Combined apparatus | 43 | 3,62 | 1,02 | 3,061 | 7/43 | $p < 0,05$ |
| | Swings | 43 | 3,35 | ,68 | | | |
| | Climbing frames | 43 | 3,01 | 1,25 | | | |
| | Balance apparatus | 43 | 3,58 | 1,17 | | | |
| | Apparatus for hanging | 43 | 3,74 | ,89 | | | |
| | Toboggan | 43 | 3,55 | 1,35 | | | |
| | Carousel | 43 | 3,17 | 1,64 | | | |
| The size of the substrate | Combined apparatus | 43 | 3,89 | 1,76 | 2,895 | 7/43 | $p < 0,05$ |
| | Swings | 43 | 2,15 | 1,95 | | | |
| | Climbing frames | 43 | 2,31 | 1,77 | | | |
| | Balance apparatus | 43 | 3,05 | 1,24 | | | |
| | Apparatus for hanging | 43 | 3,61 | ,60 | | | |
| | Toboggan | 43 | 2,75 | 1,19 | | | |
| | Carousel | 43 | 2,79 | ,94 | | | |
| Possibility of hitting | Combined apparatus | 43 | 2,64 | 1,34 | 1,521 | 6/43 | $p > 0,05$ |
| | Swings | 43 | 2,95 | 1,10 | | | |
| | Climbing frames | 43 | 2,05 | 1,58 | | | |
| | Balance apparatus | 43 | 2,83 | ,59 | | | |
| | Apparatus for hanging | 43 | 3,10 | ,92 | | | |
| | Toboggan | 43 | 2,98 | ,95 | | | |
| | Carousel | 43 | 2,84 | 1,15 | | | |

Analysis of individual characteristics of playgrounds (table 3) with apparatus taken into consideration indicate that there exists a statistically significant difference between apparatus regarding their type and size substrate ($p < 0,05$), while the possibility of hitting the device did not show any significant differences ($p > 0,05$).

Discussion

From the performed analysis of the quality of playgrounds, it can be seen that there exist poor hygienic conditions, with most playgrounds not having toilets, garbage is usually collected once a week at most, and most playgrounds do not have a sign that prohibits glass. Assessment of the quality of children's playgrounds was done on the basis of two criteria: safety and usability of the apparatus, and their quality (ACT Government, 2008, Čuk et al., 2007, Kramarić et al., 2008). Safety was estimated based on the type of substrate between apparatus and under the apparatus, size of the substrate, possibility of hitting, the instructions for handling devices, fence, and the possibility of traffic with bicycles, motorcycles and cars. Based on these analyzes, values of substrates between apparatus indicate that the average substrates are graded 3-4 on the scale, which states that they mostly consist of sand, hard macadam, and sometimes tartan and artificial substrates, although, on most playgrounds, substrates consist of natural ground. Under each apparatus, substrate of a different kind is used. Combined apparatus have the best type of substrates, which are mainly artificial surfaces such as, for example tartan. Toboggans, equipment and hanging apparatus, balance apparatus also have sufficient elastic artificial surface, but sometimes there is only natural ground beneath them. Differences considering types of substrates are also noticeable in the swing, climbing bars and carousel that do not satisfy the criteria of safety substrates around the device while possessing relatively satisfactory surface under the equipment. Lower quality substrates under these apparatus could assume their frequent usage in relation to other apparatus, which causes faster damage. By analyzing the size of substrates around the apparatus, it can be seen that the areas around combined apparatus and hanging apparatus are appropriate for normal playing conditions, and in some cases, even smaller than the predicted surface. Swings, climbing bars, balance apparatus, toboggans and carousel show differences in the size of substrates compared to the hanging apparatus and combined

apparatus. At balance apparatus and toboggans, size of the substrates is within the planned area (ACT Government, 2008, Čuk i sur., 2007), while with the carousel, swings and climbing bars, size was reduced and generally corresponds to the size of the input and output devices. The possibility of hitting, as one of the criteria of safety indicates that there are no significant differences between individual apparatus and that they were made of suitable materials with rounded edges. The best values were obtained with hanging apparatus, swings and toboggans, and the worst results at climbing apparatus. There are no guidelines for handling the devices on playgrounds. Analyzed playgrounds are mostly surrounded by a hedge or fence, and a small number of them is not fenced or enclosed so that the playgrounds can close the door. Obtained data indicates that most playgrounds allow traffic on bike, but on individual playgrounds that have a good fence, traffic is prohibited for any vehicle.

Conclusions

From analyzing safety and quality of 43 playgrounds in neighbourhood Trnje, Zagreb, it can be concluded that they differentiate when considering these two criteria. For this reason, they can be used in the realization of basic gymnastic facilities, which are related to teaching in primary school (Živčić, Breslauer, 2011), applied to a different level of quality, with different levels of security and usability of apparatus for specified age of children, and therefore, different applicability in certain gymnastic topics on apparatus on the playground. In less classroom teaching, in first to fourth grade of elementary school, of total 106 teaching topics and units that are designed and represented in the curriculum PE, 47 themes include various gymnastic topics. This means that of the total numbers of sports facilities, which are related to other sports, about 44.4% are gymnastic movement structures (Živčić, 2010). Topics that are related to the gymnastic sports, and in accordance with its main characteristics and its associated disciplines, can be divided into four groups: the basics of acrobatics, basic vaults, basics heights and stronghold on apparatus, and fundamentals of balance positions on narrow surfaces (Živčić, 2007).

Teaching topics that contain certain structures of gymnastic movements could be very successfully realized on playgrounds. This especially applies to the content and use of heights and stronghold on apparatus that can be realized on various climbing bars and apparatus for hanging, their characteristics are reminiscent of the devices in the halls, where there is a dominant influence on coordination and strength of arm and shoulder belt. Also, the contents which are related to the balance positions can be realized on narrow surfaces, edges of sidewalks and sandstone, various benches, stone walls, tree trunks, and on different types of seesaw and bridges, which are extensively represented on most playgrounds, dominantly influencing the development of static and dynamic balance. Swings, with carousel also help in development of balance and orientation in space as one of the dominant capabilities of a large number of gymnastic movement structures (Novak et al., 2008, Živčić, 2007). Toboggans, as one of the most popular playground equipment, enable different types of climbing, pulling within the basic forms of movement and thus the basic preconditions for learning gymnastic elements and techniques. On a combined apparatus, realization of different types of strong holding, walking, crawling, pulling, descending and skipping is possible, which are a part of a large number of gymnastic elements at the gymnastics all-apparatus event. Considering the conducted analysis, it is necessary to point out that more efforts should be invested in equipping and improving the quality of children's playgrounds. There are visible differences that are going in a positive direction, considering previous research (Čuk et al., 2007, Kramarić et al., 2008). Parameters that should definitely be monitored are their correctness, increase in the number of apparatus and diversity between different apparatus, use of imagination and an increase in apply to younger children, so they can enjoy games which develop skills and acquire new knowledge and ability. Also, this kind of approach allows children to spend more time in the open air which affects the improvement of their health status (Videmšek et al., 2007), and at the same time both the children and teachers develop creativity and imagination.

References

1. ACT Government (2008). Design standards for urban infrastructure-15 playgrounds and playground equipment. /on-line/. Retrieved September 15, 2013 from: www.tams.act.gov.au/
2. Badić, A., Živčić Marković, K., Sporiš, G., Milanović, Z., Trajković, N. (2012). Implementation of gymnastics contents in the classroom teaching at elementary schools of osijek - baranja county. *Acta kinesiologicala*, 1(6): 60-65.
3. Bučar Pajek, M., Čuk, I., Kovač, M., Jakše, B. (2010). Implementation of the gymnastics curriculum in the third cycle of basic school in slovenia. *Science of Gymnastics Journal*, 3(2), 15-27.
4. Čuk, I., Bučar Pajek, M., Bricelj, A., Videmšek, M. in Hosta, M. (2007). Značilnosti igral na slovenskih igriščih. *Šport*, 55(1), 29- 37.
5. Kramarić, M., Kiš, D., Švigelj, K. (2008). Sigurnost na igralištima za djecu kao društvena odgovornost. In Josip Tarad (Eds.), *Zbornik radova III Znanstveno stručne konferencije, Čakovec, 2008, "Management integralne sigurnosti"* (pp. 331-791). Zagreb: Hrvatsko društvo inženjera sigurnosti.
6. Ministarstvo znanosti, obrazovanja i športa (2006). HNOS- Nastavni plan i program za osnovnu školu. Zagreb: Ministarstvo znanosti, obrazovanja i športa
7. Novak, D., Kovač, M., Čuk, I. (2008). *Gimnastična abeceda Ljubljana: Fakulteta za šport Univerze v Ljubljani*.

8. Turšič, B. (2007). Izpeljava gimnastičnih vsebin k so v učenem načrtu tretjega triletja osnovne šole. (Magisterska naloga, Ljubljana) Ljubljana: Fakultet za šport pri Univerzi v Ljubljani.
9. Videmšek, M., Hosta, M., Bučar Pajek, M. in Čuk, I. (2007). Pomen otroškega igrišča za otrokov razvoj. *Šport*, 55(1), priloga, 3–5.
10. Wikipedia The Free Encyclopedia (2008). Playground. /on-line/. Retrieved January 15, 2014 from: www.en.wikipedia.org/wiki/Children's_playground.
11. Živčić Marković, K. (2010). Uloga i značaj sportske gimnastike u razrednoj nastavi. Zbornik Međimurskog veleučilišta u Čakovcu, 2(1). Čakovec: Međimursko veleučilište u Čakovcu.
12. Živčić Marković, K., Breslauer, N. (2011). Opisi nastavih tema i kriteriji ocijenjivanja-tjelesna i zdravstvena kultura u razrednoj nastavi. Zagreb: LIP PRINT, Međimursko veleučilište u Čakovcu
13. Živčić, K. (2007). Akrobatska abeceda u sportskoj gimnastici. Zagreb: Kineziološki fakultet Sveučilišta u Zagrebu.