

Evaluation of the flexibility parameter in gymnastic girl's 6-8 years old

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ABSTRACT

Flexibility in the sport of gymnastics is a key component which affects the sports performance of this sport. Gymnastics is a sport that is not often practiced in Albania. The purpose of this study was to identify the level of the flexibility parameter among children in gymnastics in Tirana of Albania. Method; Subjects are girls (No.11) and boys (No.7) aged 6-8 years old (7.19 ± 1.6). Subjects training 3~4 times a week for 90 minutes. Anthropometric parameters; Girls- Body Height (BH) 116.13 ± 17.91 cm, Body Weight (BW) 24.34 ± 4.02 kg and BMI 14.65 ± 1.48 kg/m² and Boys - Body Height (BH) 118.1 ± 14.9 cm, Body Weight (BW) 23.14 ± 2.02 kg and BMI 13.54 ± 1.28 kg/m². Sit and Reach Flexibility Test (SRF) and the Static Flexibility Test (SF) were applied to test interactions on the dependent variables of physical performance. Results; The results showed that there were significant differences between girls and boys in the values of the SRF and SF tests. But there were also differences between individual girls and boys in the test results. Conclusion; In conclusion, more training schedules and moderate training programs should be applied that significantly improve the flexibility of gymnasts aged 6-8 years.

Keywords: Performance analysis, Flexibility, Gymnastics, Children.

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INTRODUCTION

Gymnastics is a sport that is thought to have a significant impact on physical development, particularly for young children. Physical activity and the implementation of programs that are suitable for these age groups are generally acknowledged to have a good impact on children's natural development. Children who participate in gymnastics training can improve a number of skills, including flexibility, balance, body awareness, and coordination. It is generally accepted that children should begin practicing gymnastics between the ages of three and four.

One of the most crucial motor skills that sets gymnastics apart from other sports is flexibility (Sands et al. 2016). Flexibility guarantees the quickness, calibre, and beauty of technical movements (Ivanov and Bardina 2021; Dolbysheva et al. 2020). According to certain research, a gymnast's flexibility characterizes their range of motion (ROM) without experiencing pain and explosive power is the most important component of their performance.

Research unequivocally shows that one important quality that should be cultivated at the start of gymnastics training is the flexibility of gymnastics athletes (Ivanov and Bardina, 2021). Children who participate in gymnastics are significantly better prepared for life in general and for other sports in particular (Serin, 2019). Different people have different levels of flexibility, particularly when it comes to differences in the length of their multi-joint muscles. The literature indicates that physical activity exercises that are incorporated into gymnastics training have beneficial effects that aid in the development of bones and muscles, improve joint angles, muscular strength, and flexibility, as well as supporting the body's physical structure. To perform these motions more effectively, athletes who practice gymnastics should have enough flexibility in their muscles, tendons, ligaments, and joint capsules (Özer and Soslu, 2019b; Moeskops et al., 2019).

The optimal time to begin strength and flexibility training is said to be during the preschool years acquiring a variety of abilities (Jemni et al., 2013). Research indicates that children who engage in developmentally appropriate training exhibit noticeably greater gains in explosive leg strength, upper body strength, abdominal muscle strength, endurance, and flexibility (Madić et al., 2018). According to Kochanowicz et al. (2009) and Clowes and Knowlesvol (2013), gymnasts must regularly work on difficult technical manoeuvres in order to improve their performance and compete.

Although gymnastics is also a developed sport in Albania, its participation is very low when compared to other sports. Therefore, the number of kids participating in this sport is extremely low. Assessing the flexibility parameter in kids who participate in gymnastics was the aim of this study.

MATERIALS AND METHODS

Participants

Subjects are girls (No.11) and boys (No.7) aged 6-8 years old (7.19 ± 1.6) children who voluntarily agreed to participate. Participants in the study had these characteristics of anthropometric measurements\Girls~ Body Height (BH) 116.13 ± 17.91 cm, Body Weight (BW) 24.34 ± 4.02 kg and BMI 14.65 ± 1.48 kg/m² and boys in Body Height (BH) 118.1 ± 14.9 cm, Body Weight (BW) 23.14 ± 2.02 kg and BMI 13.54 ± 1.28 kg/m².

They had no lower or upper extremity injuries or medical. Before the data were collected, participants and their parents were informed about the benefits and possible risks of the study. An informed consent form (in line with the Declaration of Helsinki) was given to the parents of the participants to obtain their written consent

for participation. The study protocol was approved by the Research Ethics Committee of Sports University of Tirana, Albania (Approval No: 11, 2024/09).

The girls and boys trained 4 times a week for 60 minutes each, all together, with their own coach. Their training consisted of 15 minutes of flexibility exercises and the remaining 45 minutes focused on basic gymnastics movement skills.

Test protocol

Sit and Reach flexibility test

A test bench with a length of 35 cm and a width of 45 cm was used, the upper surface extending 15 cm outside the surface where the feet rested. Participant leaned on the soles of their feet against the upright surface of the box, with their arms extended forward without bending their knees. The flexibility test measurements of the participants were conducted without shoes, and they remained stationary for 1-2 seconds at the furthest point where they could flex with both hands. The best result was recorded in centimetres (González et al. 2020). The test was repeated three times <https://www.brianmac.co.uk/sitreach.htm>.

Static flexibility test

The participants lay their faces down on the flat ground with their foreheads touching the ground. They held a 2.5 cm diameter round bar with their hands and extend it up over their head without bending their arms, keeping their foreheads on the ground. The highest point they could hold the bar after three trials was recorded <https://www.brianmac.co.uk/flextest4.htm>.

Data analysis

Statistical analyse were conducted using the SPSS 20.0 program. The values were presented as mean and standard deviation and analysed at a significance level of .05. The Shapiro-Wilk test was performed to assess normality. A dependent samples t-test was used to evaluate differences within groups, while an independent samples t-test was used to analyse differences between groups.

RESULTS

Table 1 presents the results of the statistical analysis of the data obtained from the SRF and SF tests. The data are given as mean and standard deviation.

Table 1. Comparison of differences in data between groups in SRF-SF.

		Mean	SS	t	p
Girls	SRF	19.57	2.02	-5.601	.001
Boys		18.08	2.11	-2.237	.004
Girls	SF	18.68	2.03	-4.562	.003
Boys		17.24	2.09	-3.458	.002

Note. SRF-Sit and Reach Flexibility; SF- Static Flexibility.

Table 1 shows the comparison of evidence data of the girls and boys in gymnastics in the SRF and SF tests. According to the results of the dependent groups t-test, significant differences were observed between the groups in parameters obtained ($p < .05$).

DISCUSSION

Flexibility is an important health-related physical fitness (Garber et al., 2011) that allows voluntary movements with maximum joint amplitude within physiological limits without pain or restrictions (Sands et al., 2015). Flexibility is important in performing basic human movements, such as sitting, walking, jumping, and running, and controlling posture (Kim and Shin, 2020). Some studies show that girls have greater flexibility than boys due to higher concentrations of oestrogen and collagen fibres, which increase the amplitude of joints and muscles. A study on 10-year-old children reported that 75 % of boys and 35 % of girls had low flexibility (Brodersen et al., 1994). Significant differences were found between the individuals but also between the two genders in the SF and SRF parameters.

According to a study by Karakaya, B. A. (2023), the characteristics of the effect of basic gymnastics training given to the age group 7-9 years were characteristics such as flexibility, balance, agility etc., he found no statistically significant difference was found between the pre- and post-test values of locomotor skills, while a statistically significant difference was found between all other parameters used. According to the results of Temürçi, İ. (2022), the children in the training group showed positive improvements in the flamingo balance test, sit-and-reach flexibility test and other tests, but did not find significant change in the sit-and-reach flexibility test results in the control group. According to Çiçek and Türkeri (2023) in performance measurements which included vertical jump tests, flexibility tests and dynamic balance tests, administered both before and after training, showed that the training of the gymnastic group had positive results in flexibility parameters for 8 weeks of exercise.

When comparing the data for the girls' and boys' groups across the SRF and SF test batteries, significant differences were recorded within the group ($p < .05$). The results of the SRF flexibility test showed that the average of the girls' group was higher at 19.57 cm compared to that of the boys at 18.08 cm, which was also statistically significant ($p = .000$). While the SF test resulted in girls outperforming boys at 18.68 cm vs. 17.24 cm. But it should be noted that these results were low compared to the studies we have researched above.

CONCLUSION

In conclusion, more training schedules and moderate training programs should be applied that significantly improve the flexibility of gymnasts aged 6-8 years. We believe that basic gymnastics training should begin in early childhood for both girls and boys, but that the number of training sessions should be more numerous and that effective methods should be used to improve flexibility as an important element in the sport of gymnastics.

AUTHOR CONTRIBUTIONS

Ferdinand Mara led the study design in collaboration with Jorida Cobaj. He designed the training model for girls and boys 4 times a week for 60 minutes, where their training consisted of 15 minutes of flexibility exercises and the remaining 45 minutes focused on basic gymnastics movement skills. The implementation of this training was carried out by Jorida Cobaj. The protocol tests were conducted under the control of leaders F.Mara in accordance with all the design rules of the methodology to achieve the processing of the results and conclusions of this study. Both authors have read and approved the final version of the manuscript and agree to be responsible for all aspects of the work.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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