

## Postmodern Openings

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# Highlighting the Aspects to Support the Complexity of Primary Selection in Children's Alpine Skiing as a Sustainability of their Harmonious Development and Training

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**Abstract:** The extremely rapid evolution of portable technologies and children's receptiveness to constantly accessing the latest information creates the conditions for a number of new developments in most areas of activity. Moreover, their attraction to real-time visualisation of various events and competitions projects a certain level of perception and imitation of certain behaviours. Therefore, special attention should be paid to them from the earliest stages, i.e., from the time they are selected to play various sports. Also, the complementarity of some sports must be taken into account when it is desired to obtain positive results.

Age group adaptation and the investigation of some of the parameters relevant to different age groups have generated values that can support positive outcomes in the long term and thus increase motivation to participate in sport at a competitive level.

**Keywords:** *sport, primary selection, children, training complexity.*

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## 1. Introduction

The evolutionary aspects experienced throughout the world, in all fields of activity in general, and in particular in those with practical applicability, including sports, tend to characterize the modern world by adding variability to higher and higher levels, making it unpredictable, demanding and at the same time challenging. In this respect, we are constantly subject to design trends, sometimes exaggerated, sometimes effective and with a predictable purpose, meant to constantly develop new skills and determine us to redesign strategies in order to achieve significant results. Thus, new answers to the challenges of the present will be outlined and new ideas will be generated that will constitute a postmodern link between actuality and perspective.

Massive technology, portable devices, high-performance software, instant online access and the possibility of viewing theoretical, video or audio information in real time are part of today's generation, promoting the requirements of the future as a system capable of self-organization and shaping a new "picture of the world" (Haken, 2009). All these build and motivate, challenge and analyze, intertwining in a direction characteristic to the postmodern world and in which performance is like ephemeris.

In this respect, the discoveries made, the researches and the studies carried out constantly in all fields of activity force the limits of the humanity, leading the performance to a rank of art; a great art reborn by intertwining interdisciplinarity with the absolute, curiosity with the unknown, unlimited with recklessness, etc. Thus, the performances of postmodernism will be permanently renewed, their authors receiving the edification and praise of their glory, the celebration of these moments being done with pomp and cheering, the most spectacular being, always, those in the field of sports.

Postmodern sports performance can be called absolute art, forcing human limits, by contributing technology to research in sports science, reshaping and redefining the trends of selection, training and improvement of athletes. These trends specific to each level of activity must establish long-term tangencies from the beginning to the achievement of sports performance, subsequently creating resources and strategies to maintain it as much as possible.

Due to the fact that each sporting event has its own specifics, each sport has its own rules and categories of participation, the initiation in each of them is made scientifically, in applied and differentiated manner. Moreover, the social development of urban areas and the internationalization of postmodern human collaborations, cause an increased

attention to the current generations of children on their training, preparation and guidance to a direction as appropriate to their motor skills, as well as increasing the number of who want and can be directed towards the practice of a performance sport. Regardless of the sport he will practise, the child will go through different stages of preparation that inevitably start with different tests, adapted to his age, and which begin with the selection stage.

Organised sports training can start at an early age as part of the primary selection process and can play an important role in the later development of future athletes. Physical exercise, through walking, running, jumping, throwing, climbing, swimming, dancing, skiing, etc. can be carried out by pre-school children without excessive physical effort and can contribute to the development of skills and their gradual preparation up to performance level. Together with the other forms of training "the formative-educational process contributes to moulding and defining the individual through the accumulation of theoretical and practical information and the inter-human communication as a result of the relationship with the peers" (Cilibiu & Plasto, 2019).

As is well known, "motor qualities are attributes of the body that give the individual the possibility to execute various motor acts linked to both the daily activity and sports activity. In the learning process, an important place in the teacher's concerns is taken by finding and using in preparation the most efficient methods and means to ensure the development of these qualities" (Pelin, Turcu & Tohănean, 2018). Considering the fact that "sports performance value represents the result of some continuous, efficient and effective activities, rigorous organized and always tailored to the requirements of performance sports" (Mihai, 2012), "talent selection processes should consider both the biological maturity status as well as the relative age; additionally, a competition system based on a rotating cut-off date might contribute to a reduction of RAE-relative age effect" (Steidl-Müller, Hildebrandt, Raschner, & Müller 2019).

At the same time, regardless of the sport practiced „the psycho-behavioural reactions (mostly) will be influenced by the internal condition of organizing the system: in humans, external conditions do not directly and mechanically produce reactions, but only on the basis of filtering, processing, by permanently reporting to the inner needs and possibilities of the individual" (Predoiu, R., Predoiu, A., Gherghisan, Alexe & Grigore, 2019). At the same time, regardless of the sport practiced, too "the human muscular system is made up of striated or skeletal muscles. The study of muscles in general, especially in terms of energy, is very interesting and essential for understanding the motor functions of the human body

(Koronas & Koutlianos, 2020). Moreover, extending these aspects to different areas of activity in which the individual is involved through direct or indirect action, motor or intellectual "nano-innovation will be seen in many sectors, including public health, employment and occupational safety and health, the information society" etc. (Tătar, 2020) and which „in order to be useful to the decision makers, information must be easy to understand and faultless” (Mălăescu & Popovici, 2015). „It is important to remember how you were when you went to school as children. Of course, you remember certain things that you liked very much or certain activities that you did well or with great precision” (Chera-Ferrario & Plastoi, 2016) because this aspect can assure us „the development of the technical and tactical learning; decision-making through effective questions; and the development of skills and abilities” (Zetou, Koronas, Athanailidis & Koussis, 2012). „By transferring the ones mentioned in the motor area of the individual, his education and education (implicitly self-education) is allowed and conditioned by several factors including: the desire to evolve (in terms of body expressiveness and not only), individual will, personal perception etc.” (Plastoi, 2018). More than that "the relation between the form and objective becomes doable, easy to objectify, with major importance in individual performance” (Hikerin, Pîrvan, Angelescu, Botezatu & Ciurea, 2009).

„Motivating for the individual sports activities, because he sees others and try to emulate or exceed them and thus reaching to overcome, which means a change in behavior.” (Tohănean, Chicomban & Drugău, 2011). "...a deeper understanding of certain possible relationships between the specific psychological training and the dynamics of the confusion and bewilderment moods can be achieved only by studying the relationships between these moods and other essential factors (other moods, biological factors, ambiance, human relationships, etc.)” (Alexe, C.I., Alexe, D.I. & Iconomescu, 2013). "Concerning the realization of a biochemical testing and practice system which would emphasize the segmental behavior can generate a positive influence of the technique and the efficiency of using energetic resources” (Pîrvan, 2009).

## 2. Literature review

Intense social challenges have generated situations whose feedback is currently felt in many ways that influence the education, upbringing and development of children from an early age (Bekh, Vashkevych, Kravchenko, Yaroshenko, Akopian, & Antonenko, 2021; Torkos, & Egerau, 2020), sport

remaining one of the links of human communication (Popescu-Bradiceni, Plastoi, Mihai, Mihăilescu, Buțu, Cătuna, & Teodorescu, 2021).

Their psycho-motor development is connoted at a high level due to the unlimited possibilities offered by parents (conscious or unconscious) which can have positive and negative consequences at the same time (Henry, M'Bailara, Poinot, Desage, & Antoniol, 2006; Henry, M'bailara, Poinot & Falissard, 2007; Save-Pedebos, Bobet & Morel, 2013). More and more authors are talking about these effects with major repercussions on the health condition and mental consumption that children show starting from the age of 3, including Korte, Calmbach, Florack & Mendes (2020).

Moreover, the readjustment of some standards regarding the motor capacity of these children are presented in various specialized studies, their impact generating a series of reconsiderations and rearrangement of the way in which a selection is made, at a young age, for children's practising a performance sport (Lupu, 2011; Shiller & Rochon, 2014).

The postmodernist approach calls forth a folding and proper management of the way in which a selection is made for performance sports, its projectivity involving many other transdisciplinaritys that will result in a complexity and a major evolution (Astalosh, Mykulanynets & Zhyshkovych, 2022).

### **3. Methodology**

The teachers of the School Sports Club of Petroșani carried out the primary selection at the extended day kindergarten in the city of Petroșani at the beginning of the school year 2019-2020 in order to select for the sports disciplines of the curriculum, alpine skiing and aerobic gymnastics. The teaching staff of the two disciplines have made this selection together because the two disciplines are predominantly technical disciplines and the educational instructional process takes place over a long period. Moreover, teachers will take into account that "the visual feedback will determine the growth of the specific strength level, facilitating the improvement of the performance" (Mihăilescu, Tudorache & Mihai, 2017) and "the body expressiveness is a result of the development of various motor activities, activities that find their implications in all executions of elements and procedures specific to different types of sports." (Plastoi & Buțu, 2018). Because the two subjects are mainly technically oriented, the organised educational instructional process starts from the early ages of 4-6 years. The target group consisted of 103 children.

### ***Hypothesis***

By readjusting and redistributing the tests required by a primary selection compatible with the level of development of bio-motor capacity in children aged 4-6 years, an adequate selection and a more correct targeting for practising performance sports will be achieved.

These endeavours come to support and restore, in the long run, the increase in the number of children who will practise performance sports because, in recent years, the feedback obtained in this regard requiring too small a number of practitioners of performance sports in early age categories, which can not support the continued performance at the junior and senior ages.

Thus, the aspects we have mentioned support the complexity of the selection for performance sports due to the aspects that stand out through the evolution of an increasingly early bio-psycho-motor development and due to the permissive access to various online accesses from an early age.

The purpose of these tests was to evaluate the bio-motor capacities of children aged 4 to 6 years old, in order to make a primary selection for the constitution of two groups of beginners in the two disciplines: alpine skiing and aerobic gymnastics. Also following this evaluation, we aimed to develop minimum standards to be met by the pupils in order to be admitted to an organised training system. The activity took place in the PP3 extended day kindergarten in Petroșani. The sample consisted of 103 children, 48 girls and 55 boys, distributed as follows: 41 children aged 4, 38 children aged 5 and 24 children aged 6.

We would like to mention the fact that the endeavours regarding the selection of the children were made through communication addresses from the director of the Petrosani sports club to the directorates of the respective centres. Also, the promotion of the information was achieved during the parent meetings, during which they gave their verbal consent to the involvement of their own children in the organized selection. Subsequently, through the various activities carried out in the classroom, in groups of children, with the support and together with each pre-primary school teacher, they were promoted through video recordings and Power Point presentations made as appealing as possible, adapted to the children's age and level of understanding. Following these activities, the children expressed their willingness to participate in the initial selection in order to be part of the group of children who will be taught how to ski. They were verbally communicated with expressions and contents appropriate to their level of understanding that the results obtained by them would be "marked on sheets of paper, their first names being written in their preferred color and put in a

certain order." The evaluation of each child was carried out after the explanation and prior demonstration of each test, and the participation was organized using colors and auxiliary materials that outlined a pedagogical climate that constantly stimulated them and caught their attention.

The minimum height in the 4-year age group was 100 cm (girls) and 102 cm (boys), respectively, while the maximum height was 110 cm in both genders. The weight measured was between 14 and 20 kg in girls and 15 and 22 kg in boys.

In the 5-year age group, 38 subjects participated in the assessment, 13 girls and 25 boys. The minimum height in this category was 109 cm, while the maximum height was 121 cm in both genders. In terms of weight, it ranged between 16 and 22 kg in girls and 16 and 26 kg in boys.

In the age group 6 years, 24 subjects participated in the selection, 13 girls and 11 boys. The minimum height at this age was 115 cm for girls and boys, while the maximum height was 120 cm for girls and 121 cm for boys, and the weight measured was between 19 and 25 kg for girls, 19, and 26 kg for boys.

Tests applied:

**Shuttle.** Test description: two circles drawn on the floor/asphalt, 5m apart. In one circle, 3 pegs/objects are placed that the child has to take one by one and place in the empty circle. The start is taken at the sound signal from the empty circle, and the timer starts when the foot is lifted off the floor/asphalt and stops when the child has placed the last milestone/object in the circle. The speed of movement is assessed and the times achieved are given in seconds.

**Long jump from a standing position.** Description of the event: a ruler is drawn on the floor/asphalt, with the marking in cm. Place the toes of the trainers at the start line without stepping on it, feet shoulder-width apart, to prepare the run-up. The swing is represented by swinging the arms up and back while bending the knees. The take-off is achieved by a vigorous push to the feet and pulling the knees to the chest on the fly. Landing is done first on the heels and then on the whole sole. Note in cm the length achieved at the point of contact of the heels with the ground. The better of two jumps is scored. The explosive force of the lower limbs is assessed.

**Jumps with 360° return.** Description of the test: Draw a circle divided into 4 on the floor/hard surface. From a standing position, feet shoulder-width apart, perform a right turn jump and a left turn jump. Score, in degrees (°), according to the rotation performed, i.e. the landing point. The coordination skills are assessed.

Following the action carried out in the Alpine skiing discipline, 25 pre-school children were selected, 15 of whom presented themselves.

**Methods used:** observation method; development of control samples; data recording; statistical-mathematical method.

In the analysis of all the data obtained from the experiment, we looked at how the values that make up the series are distributed in the range between a minimum and a maximum, around the mean. At the same time, we paid attention to establishing the central tendency of the statistical series, i.e. the frequency of occurrence of the values, in order to determine the most common ones. We also quantified some statistical indicators (mean, standard deviation, median, Table 1) in order to make an overall assessment of the whole series of values, without taking into account each individual value, yet, highlighting various properties of the series of values.

For the whole sample of children, consisting of 103 pre-school children aged 4-6 years, we can specify the following statistical indicators:

Table 1

		Age	Gender
N	Valid	103	103
	Missing	0	0
Mean		4.83	
Std. Error of Mean		0.077	
Median		5.00	
Mode		4	
Std. Deviation		0.781	
Variance		.610	
Skewness		.299	
Std. Error of Skewness		.238	
Kurtosis		-1.296	
Std. Error of Kurtosis		.472	
Range		2	
Minimum		4	
Maximum		6	
Sum		498	
Percentiles	25	4.00	
	50	5.00	
	75	5.00	



As can be seen in Table 1, the mean age is 4.83 years with a standard error from the mean of 0.077. The median for the sample analysed is 5 years, while the mode is 4. The standard deviation related to the age of the selected children is 0.781. Also, more than 25% of the children analysed are aged 4 years (Percentile 25 = 4 years), while more than 75% are under 6 years (Percentile 75 = 5 years).

Tables 2 and 3 show the frequencies by age and gender (Figure 1) of the study participants.

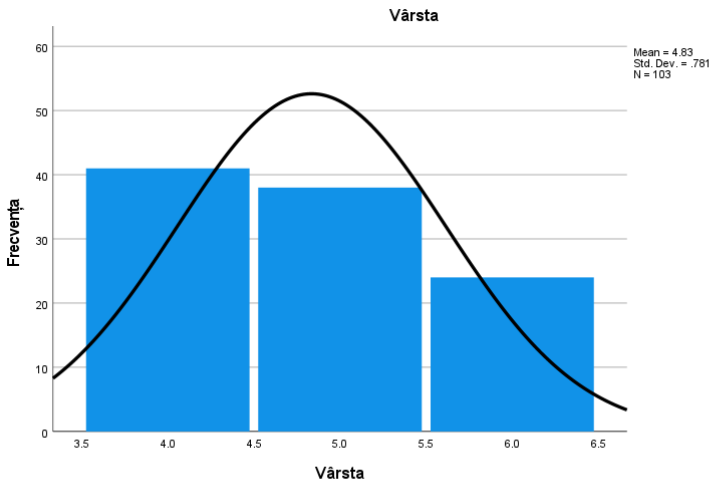
**Table 2**  
**Age**

		Absolut frequency	Relative Percentage frequency	Valid percent age	Relative cumulative percentage frequency
Valid	4	41	39.8	39.8	39.8
	5	38	36.9	36.9	76.7
	6	24	23.3	23.3	100.0
	Total	103	100.0	100.0	

**Table 3**  
**Gender**

		Absolute frequency	Relative Percentage frequency	Valid percent age	Relative cumulative Percentage frequency
Valid	Female	48	46.6	46.6	46.6
	Male	55	53.4	53.4	100.0
	Total	103	100.0	100.0	

The interpretation of these values is shown in graph 1 as follows: the target group is composed of 103 children, of which 48 girls (representing 46.6%) and 55 boys (representing 53.4%). There are 41 children aged 4 (39.8%), 38 children aged 5 (36.9%) and 24 children aged 6 (23.3%).



Graph 1

Of the 4-year age group, 41 children participated in the selection, 22 girls and 19 boys. The minimum height in this group was 100 cm (girls) and 102 cm (boys), while the maximum height was 110 cm in both genders. The weights ranged from 14 to 20 kg for girls and 15 to 22 kg for boys.

Table 4

N	Gender	Long jump	Jump with	Jump with	Shuttle 5
		from a standing position	360° return R	360° return S	
Valid	41	41	41	41	41
Missing	0	0	0	0	0
Mean	1.46	69.76	154.88	151.71	18.2615
Std. Error of Mean	.079	3.113	7.003	7.784	.43637
Median	1.00	65.00	150.00	150.00	17.9200
Mode	1	50 <sup>a</sup>	100	100	18.14 <sup>a</sup>
Std. Deviation	.505	19.936	44.840	49.845	2.79415
Variance	.255	397.439	2010.610	2484.512	7.807
Range	1	80	150	150	12.21
Minimum	1	30	100	100	14.38
Maximum	2	110	250	250	26.59

Sum	60	2860	6350	6220	748.72	
Percentiles	25	1.00	55.00	120.00	100.00	15.9950
	50	1.00	65.00	150.00	150.00	17.9200
	75	2.00	85.00	180.00	180.00	20.2450

a. Multiple modes exist. The smallest value is shown

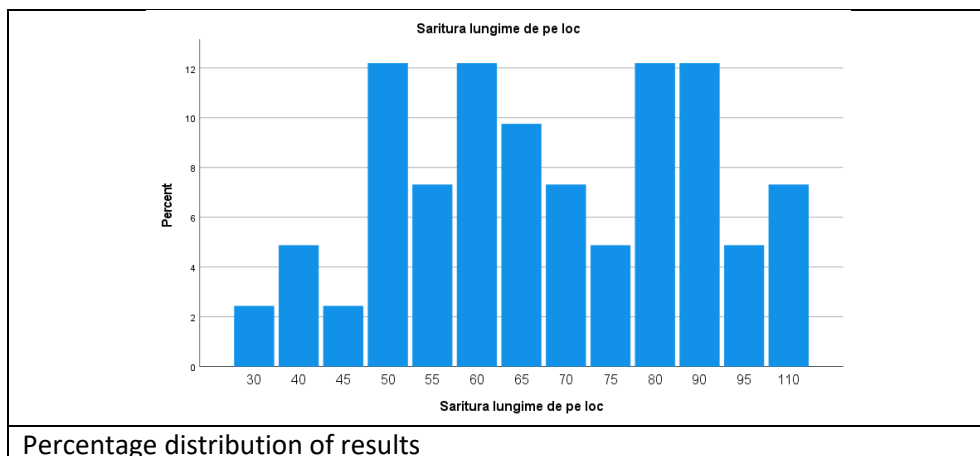
#### 4. Results of research

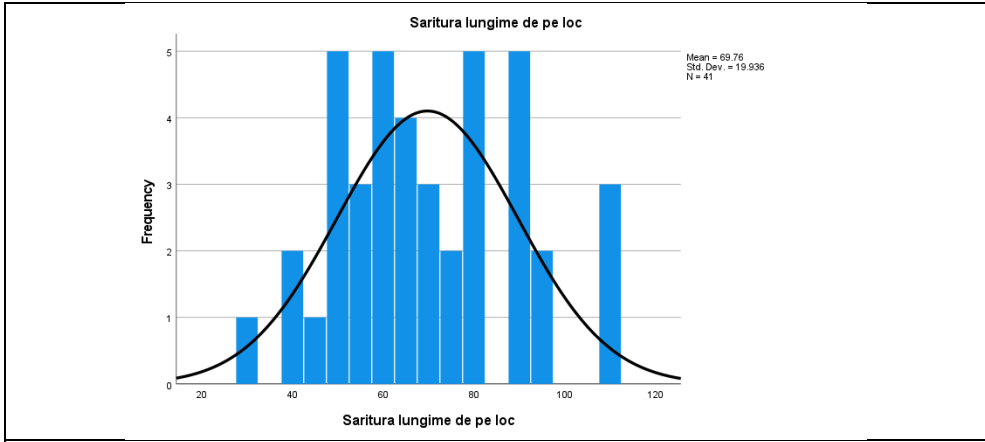
For the long jump from a standing position test, the following statistical indicators were obtained:

- Minimum value recorded: 30 cm
- Maximum value recorded: 110 cm
- Average value: 69.76 cm
- Standard error: 3.113 cm
- Median: 65 cm
- Standard deviation: 19.936

The distribution for the results of the control test "long jump from a standing position" for 4-year-olds is shown below, both as a percentage and by frequency (graph 2):

Graph 2





Histogram of distribution according to frequencies of occurrence of results

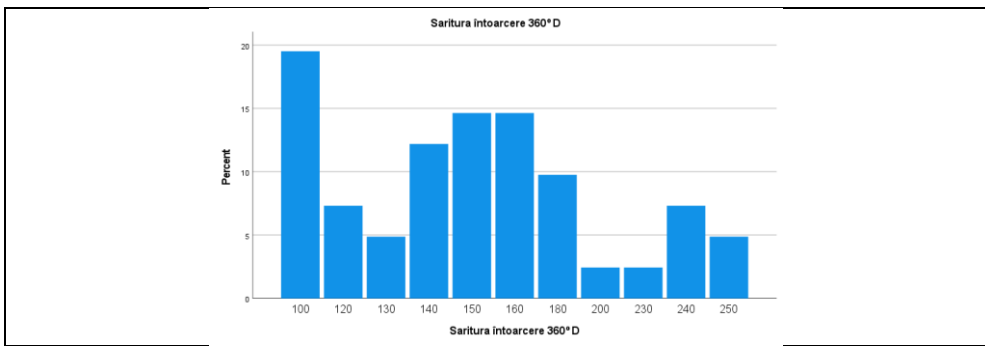
Interpreting the quartiles, we can appreciate that 25% of 4 year olds scored < 55cm (25th percentile), 50% below the median (65cm - 50th percentile), and 75% of children scored < 85cm (75th percentile), (graph 2).

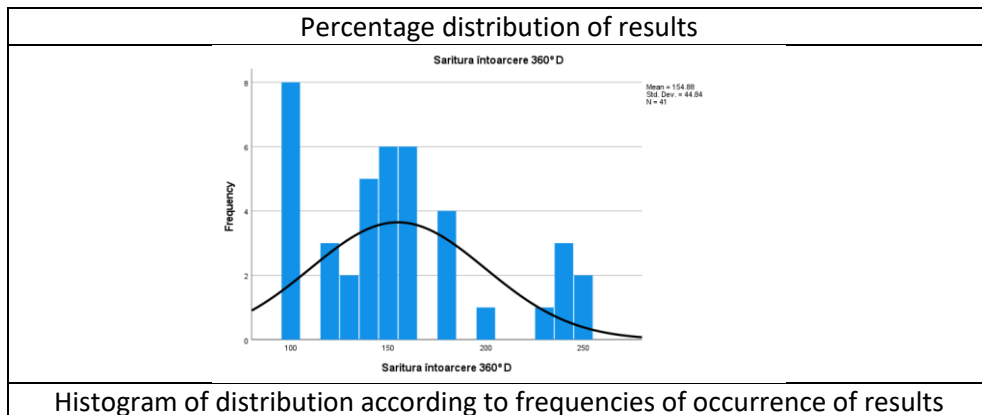
The following statistical indicators were obtained for the “turn jump, 360° to the right” event, the distribution of which is shown in Graph 3.

- Minimum value recorded: 100°.
- Maximum value recorded: 250°
- Average value: 154.88°.
- Standard error: 7.784°
- Median: 150°
- Standard deviation: 44.840°

Interpreting the quartiles, we can see that 25% of 4 year olds scored < 120° (25th percentile), 50% below the median (150° - 50th percentile), and 75% of children scored < 180° (75th percentile), (graph 3).

Graph 3



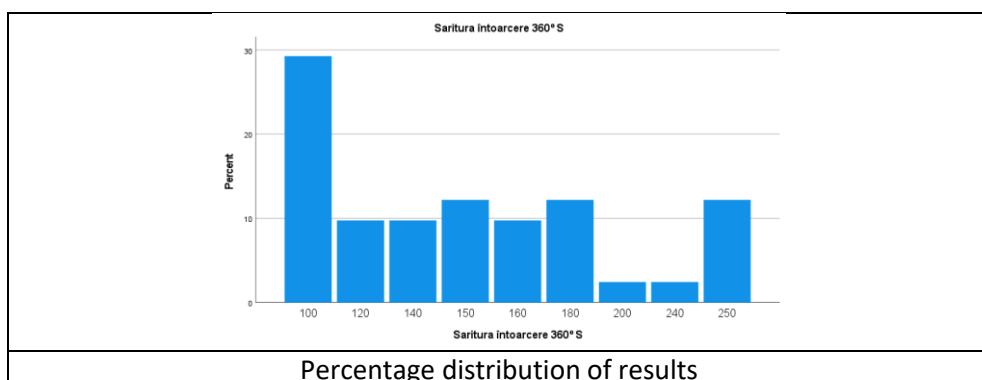


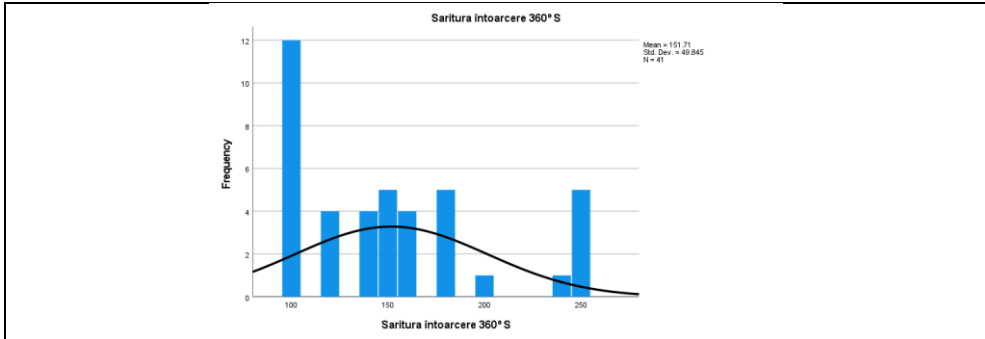
The following statistical indicators were obtained for the "left turn jump, 360° left" event (graph 4):

- Minimum value recorded: 100°
- Maximum value recorded: 250°
- Mean value: 151.71°
- Standard error: 7.003°
- Median: 150°
- Standard deviation: 49.845°

The distribution for the results of the control test Turning Jump, 360° to the Left, for 4-year-olds is shown in Graph 4, both as a percentage and by frequency.

Graph 4





**Histogram of distribution according to frequencies of occurrence of results**

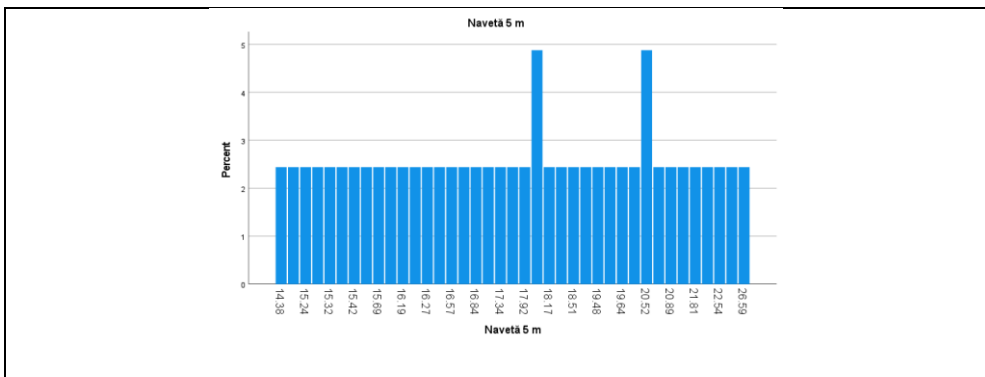
Interpreting the quartiles, we can see that 25% of 4-year-olds scored < 100° (25th percentile), 50% below the median (150° - 50th percentile), and 75% of children scored < 180° (75th percentile).

For the "5m shuttle" sample, the following statistical indicators were obtained (graph 5):

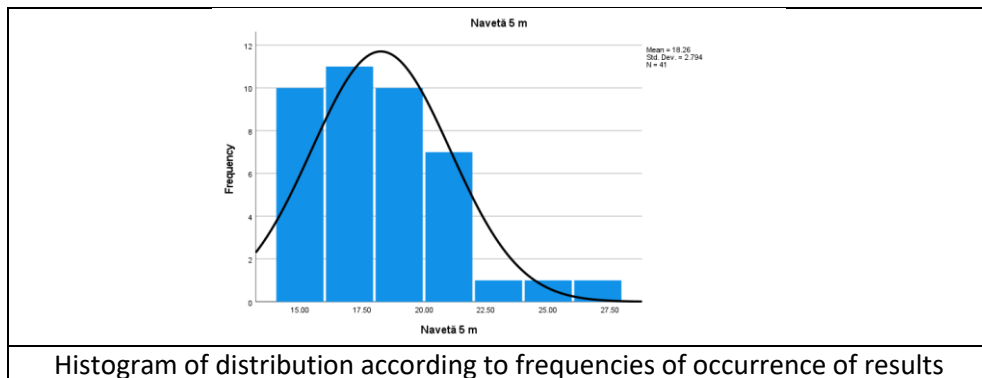
- Minimum value recorded: 14.39s
- Maximum recorded value: 26.59s
- Average value: 18.26s
- Standard error: 0.436
- Median: 17.92s
- Standard deviation: 2.794s

The distribution for the results of the Shuttle 5m control test for 4-year-olds is shown both as a percentage and by frequency (graph 5).

**Graph 5**



**Percentage distribution of results**



Interpreting the quartiles, we can appreciate that 25% of the 4-year-olds obtained times < 15.995s (25th percentile), 50% below the median value (17.92s - 50th percentile), and 75% of the children obtained times less than 20.245s (75th percentile).

*For the age sub-group 5 years, statistical data indicate that for a total of 38 subjects, of which 13 girls and 25 boys. The minimum height in this group was 109 cm, while the maximum height was 121 cm in both genders. In terms of weight, it ranged between 16 and 22 kg in girls and 16 and 26 kg in boys. The summary of the values obtained in the above mentioned samples are shown in Table 5.*

**Table 5**

**Statistics**

	Gender	Long jump from a standing position	Jump with 360° return R	Jump with 360° return L	Shuttle 5 m	
N	Valid	38	38	38	38	
	Missing	0	0	0	0	
Mean		1.66	57.24	186.84	181.58	18.3534
Std. Error of Mean		.078	2.956	8.108	8.190	.54503
Median		2.00	60.00	190.00	180.00	18.4450
Mode		2	50 <sup>a</sup>	180 <sup>a</sup>	180	18.49
Std. Deviation		.481	18.222	49.979	50.486	3.35979
Variance		.231	332.023	2497.866	2548.791	11.288
Range		1	80	180	180	14.17
Minimum		1	20	100	100	13.32
Maximum		2	100	280	280	27.49
Sum		63	2175	7100	6900	697.43

Percentiles	25	1.00	40.00	150.00	145.00	15.6750
	50	2.00	60.00	190.00	180.00	18.4450
	75	2.00	71.25	222.50	220.00	20.3525

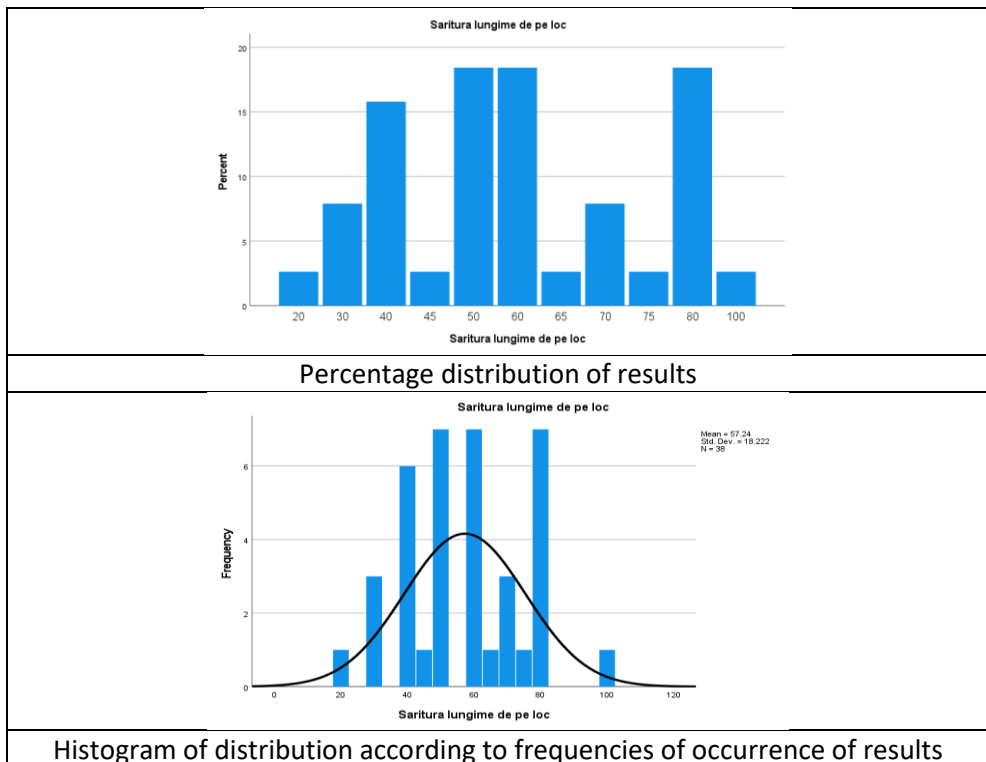
a. Multiple modes exist. The smallest value is shown

For the test "long jump from a standing position", the following statistical indicators were obtained:

- Minimum value recorded: 20 cm
- Maximum value recorded: 100 cm
- Average value: 57.24 cm
- Standard error: 2.956 cm
- Median: 60 cm
- Standard deviation: 18.222.

For 5-year-olds, the distribution for the results of the control test "long jump from a standing position" is shown in Graph 6, both as a percentage and by frequency.

Graph 6





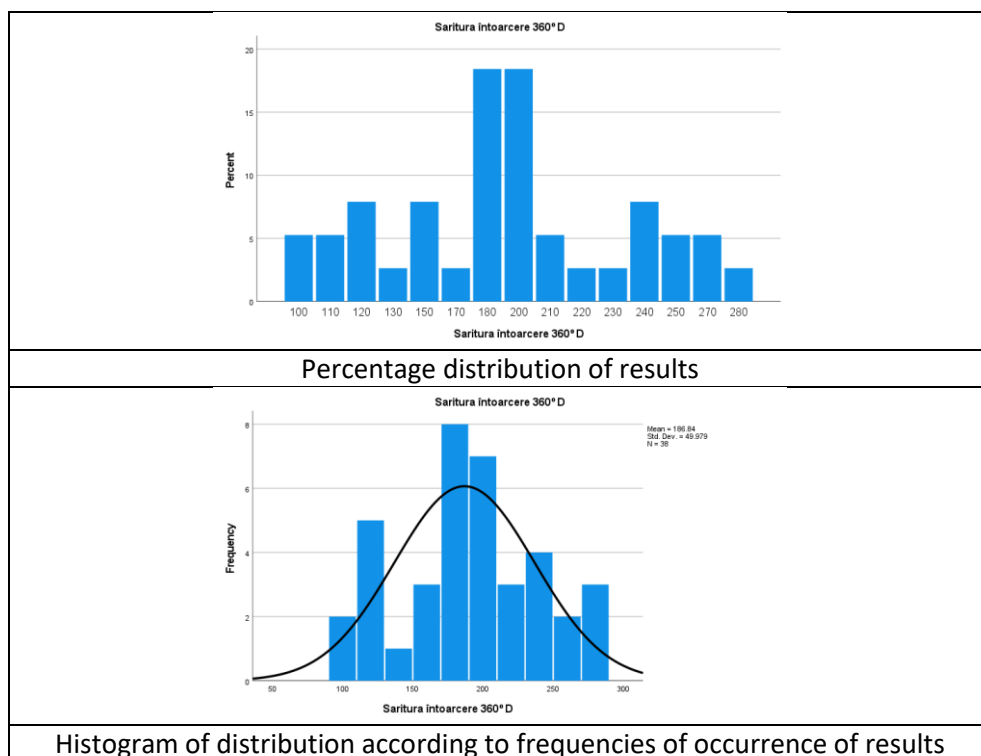
Interpreting the quartiles, we can appreciate that 25% of the 5 year olds jumped below 40cm (25th percentile), 50% below the median (60cm - 50th percentile), and 25% of the children jumped more than 71.25cm (75th percentile).

The following statistical indicators were obtained for the "right 360° turn jump" test:

- Minimum value recorded: 100°
- Maximum value recorded: 280°
- Average value: 186.84°
- Standard error: 8.108°
- Median: 190°
- Standard deviation: 49.979°.

The distribution for the results of the control test "jumping through the turn, 360° to the right" for 5-year-olds is shown in Figure 7, both as a percentage and by frequency.

Graph 7



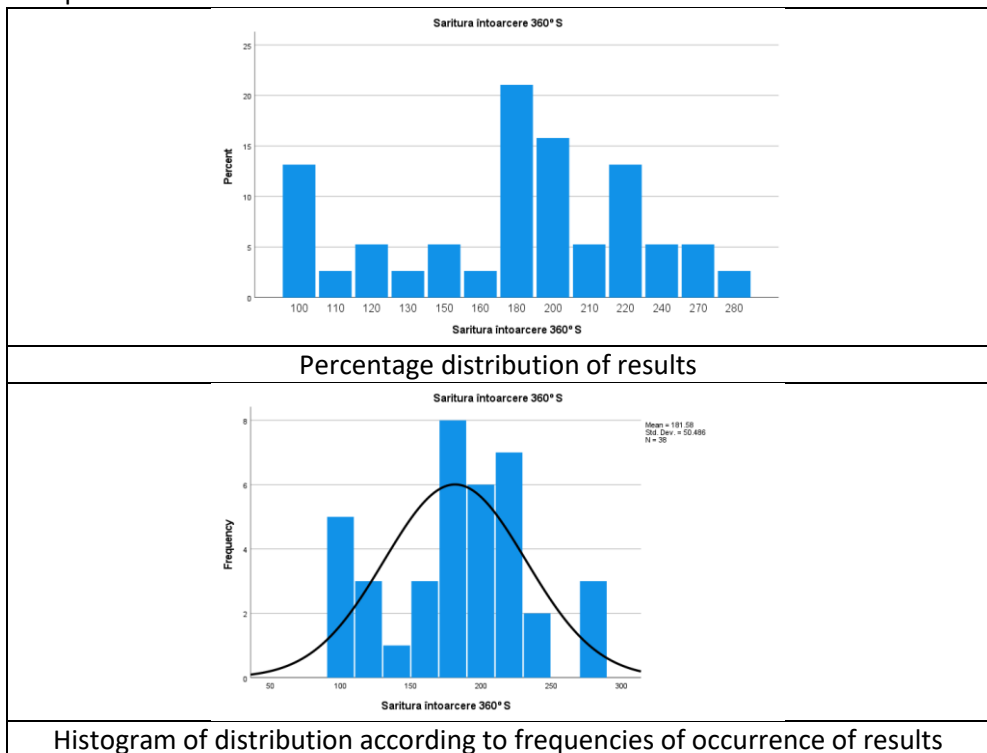
Interpreting the quartiles, we can see that 25% of the 5-year-olds scored  $< 150^\circ$  (25th percentile), 50% below the median ( $190^\circ$  - 50th percentile), and 25% of the children scored  $> 222.50^\circ$  (75th percentile).

The following statistical indicators were obtained for the "jump through the turn,  $360^\circ$  left" event:

- Minimum value recorded:  $100^\circ$
- Maximum value recorded:  $280^\circ$
- Average value:  $181.58^\circ$
- Standard error:  $8.190^\circ$
- Median:  $180^\circ$
- Standard deviation:  $50.486^\circ$ .

The distributions for the results of the control test "jump by turning,  $360^\circ$  to the left" for 5-year-olds are shown both as a percentage and by frequency in Graph 8.

Graph 8



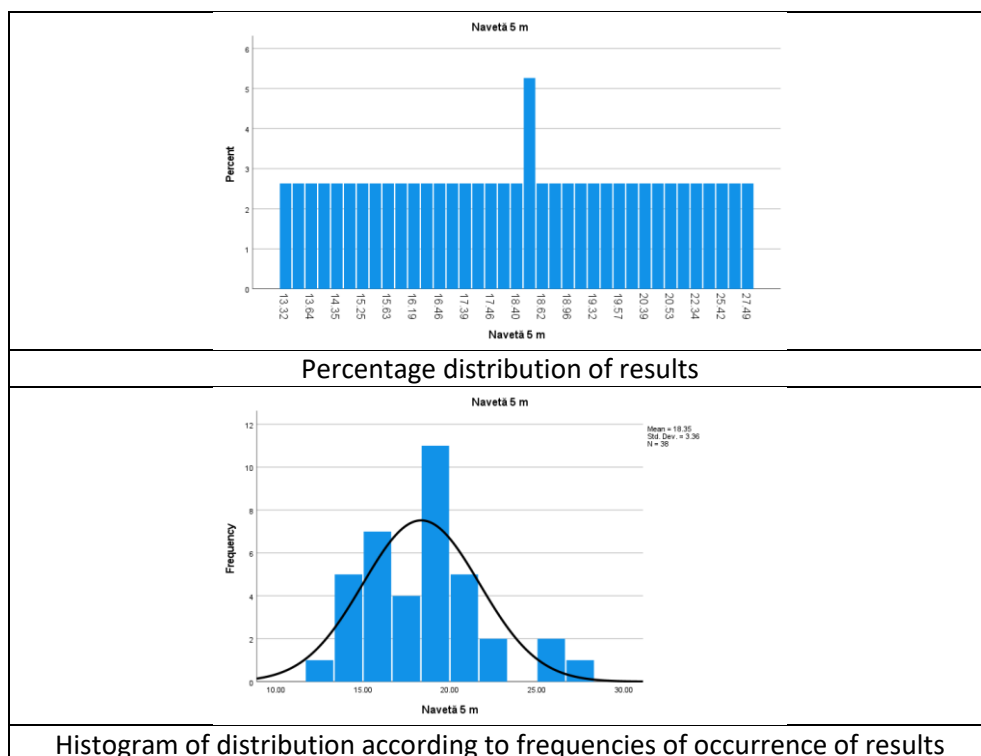
Interpreting the quartiles, we can see that 25% of 5-year-olds scored < 145° (25th percentile), 50% below the median (180° - 50th percentile), and 25% of children scored > 220° (75th percentile).

For the 5m shuttle test, the following statistical indicators were obtained:

- Minimum value recorded: 13.32s
- Maximum recorded value: 27.49s
- Average value: 18.353s
- Standard error: 0.545
- Median: 18.445s
- Standard deviation: 3.359s.

The distribution for the results of the "5m shuttle" control test for 5-year-olds is shown in Graph 9, both as a percentage and by frequency.

Graph 9



Interpreting the quartiles, we can appreciate that 25% of the 5-year-olds obtained times < 15.675s (25th percentile), 50% below the median

value (18.445s - 50th percentile), and 25% of the children obtained times greater than 20.352s (75th percentile).

**For the age sub-group 6 years**, the statistics indicate that we have a number of 24 subjects, of which 13 girls and 11 boys. The minimum height in this group was 115 cm in girls and boys, while the maximum height was 120 cm in girls and 121 cm in boys. In terms of weight, it ranged between 19 and 25 kg in girls and 19 and 26 kg in boys (Table 6).

Table 6  
**Statistics**

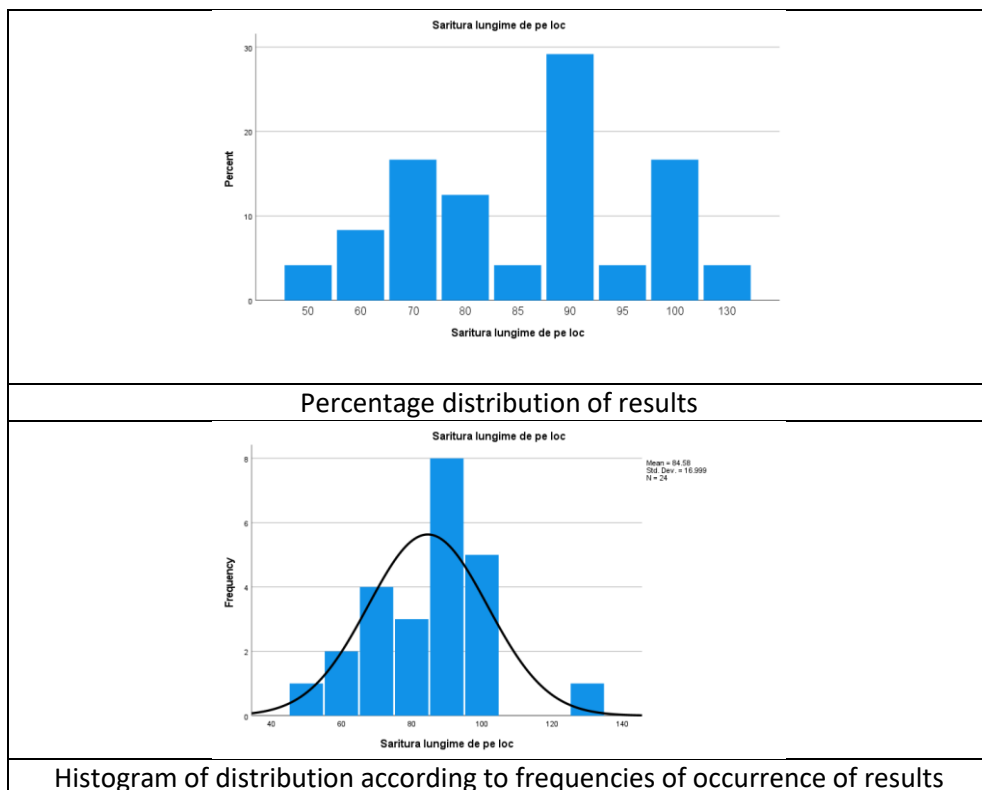
	Gender	Long jump from standing position	Jump with 360° return R	Jump with 360° return L	Shuttle 5 m	
N	Valid	24	24	24	24	
	Missing	0	0	0	0	
Mean	1.46	84.58	273.33	253.75	13.3458	
Std. Error of Mean	.104	3.470	11.368	11.528	.22335	
Median	1.00	90.00	270.00	265.00	13.5000	
Mode	1	90	270	280	14.35	
Std. Deviation	.509	16.999	55.691	56.477	1.09419	
Variance	.259	288.949	3101.449	3189.674	1.197	
Range	1	80	200	210	4.23	
Minimum	1	50	180	150	11.24	
Maximum	2	130	380	360	15.47	
Sum	35	2030	6560	6090	320.30	
Percentiles	25	1.00	70.00	242.50	200.00	12.4600
	50	1.00	90.00	270.00	265.00	13.5000
	75	2.00	93.75	315.00	280.00	14.1950

The following statistical indicators were obtained for the "long jump from a standing position" event for 6-year-olds:

- Minimum value recorded: 50 cm
- Maximum value recorded: 130 cm
- Average value: 84.58 cm
- Standard error: 3.470cm
- Median: 90 cm
- Standard deviation: 16.999.

The distribution for the results of the control test "long jump from a standing position" for 6-year-olds, both as a percentage and as a function of frequency is shown in Graph 10.

Graph 10



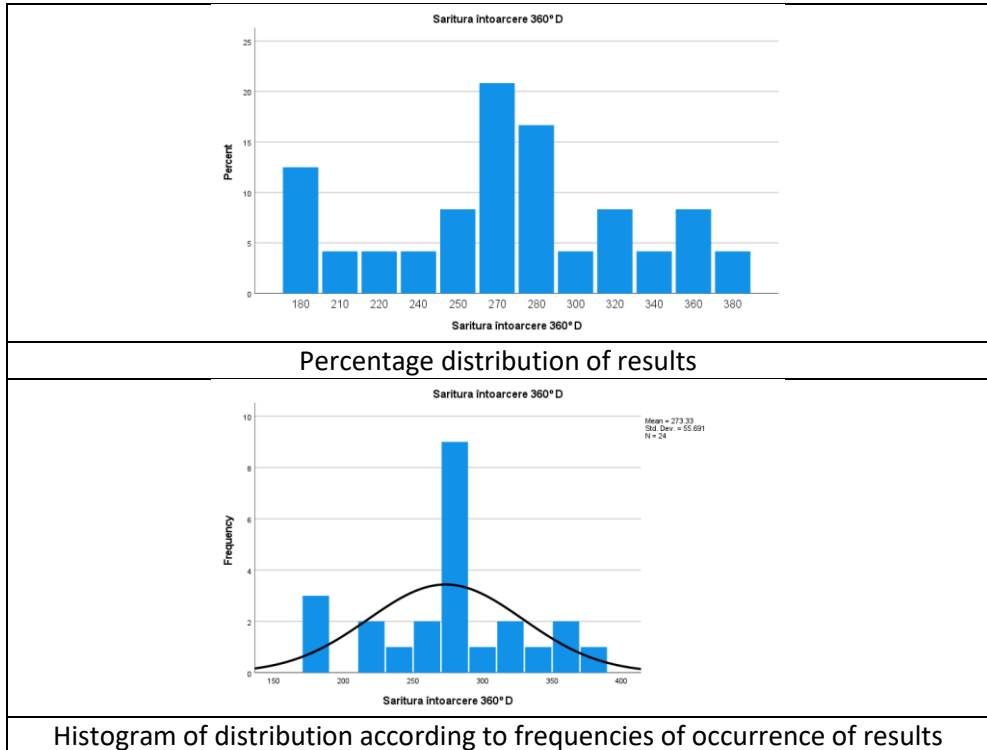
From the histogram of the distribution of the results according to the frequency of occurrence and by interpreting the quartiles, we can appreciate that 25% of the 6-year-olds jumped below 70 cm (25th percentile), 50% below the median value (90 cm - 50th percentile), and 25% of the children jumped more than 93.75 cm (75th percentile).

*The following statistical indicators were obtained for the event "jumping by turning 360° to the right":*

- Minimum recorded value: 180°
- Maximum recorded value: 380°
- Average value: 273.33°
- Standard error: 11.368°
- Median: 270°
- Standard deviation: 55.691°

The distribution for the results of the control test "jumping through the turn, 360° to the right" for 6-year-olds is shown both as a percentage and as a function of frequency (graph 11).

Graph 11



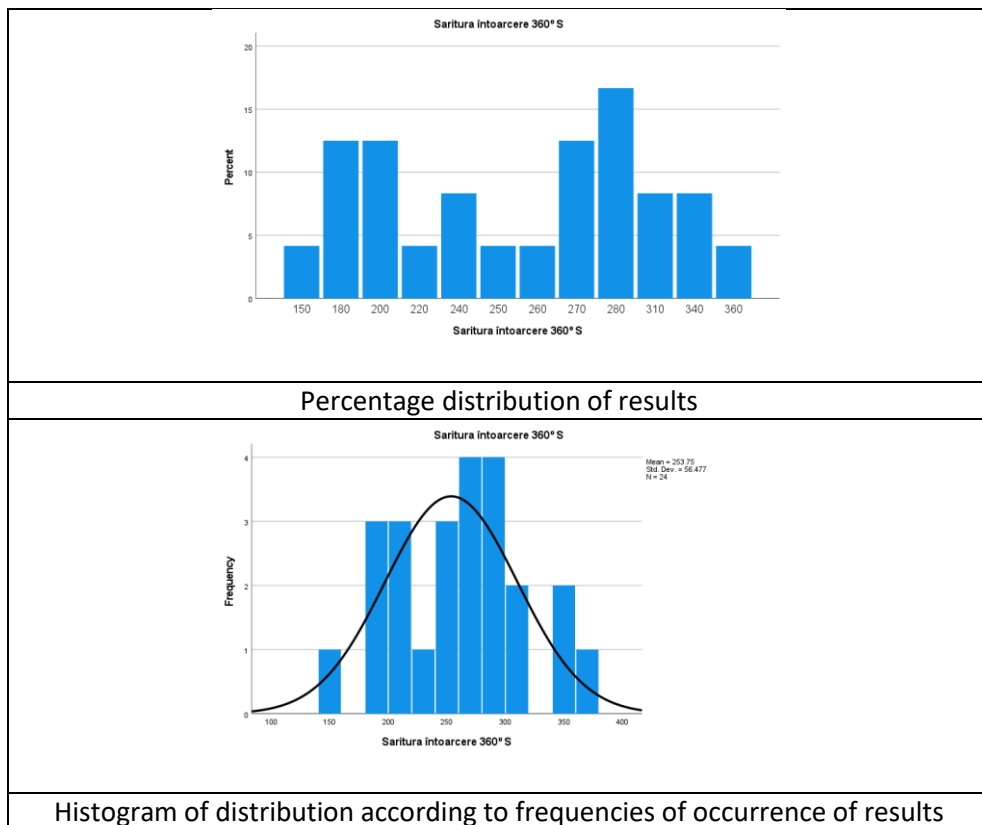
Interpreting the quartiles, we can see that 25% of the 6-year-olds scored < 242.50° (25th percentile), 50% below the median (270° - 50th percentile), and 25% of the children scored > 315° (75th percentile).

The following statistical indicators were obtained for the "jump through the turn, 360° left" test:

- Minimum recorded value: 150°
- Maximum recorded value: 360°
- Average value: 253.75°
- Standard error: 11.528°
- Median: 265°
- Standard deviation: 56.477°

The distribution for the results of the control test "jump through the turn, 360° to the left" for 6-year-olds is shown both as a percentage and by frequency in Figure 12.

Graph 12



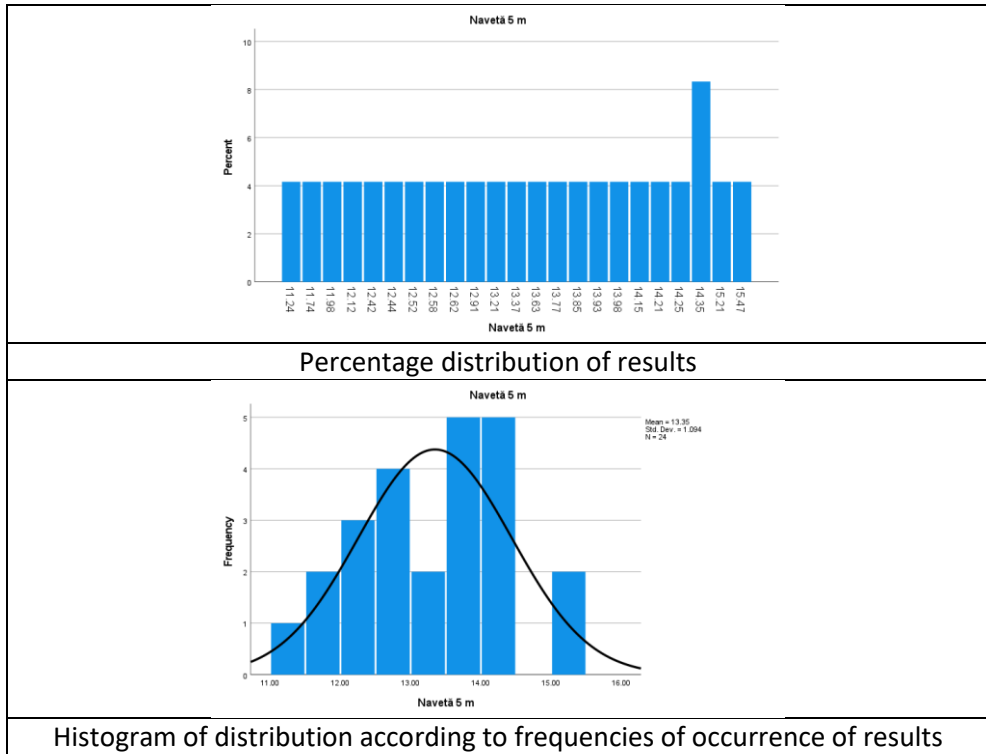
Interpreting the quartiles, we can see that 25% of the 6-year-olds scored  $< 200^{\circ}$  (25th percentile), 50% below the median ( $265^{\circ}$  - 50th percentile), and 25% of the children scored  $> 280^{\circ}$  (75th percentile).

For the "5m shuttle" test, the following statistical indicators were obtained:

- Minimum value recorded: 11.24s
- Maximum recorded value: 15.47s
- Average value: 13.345s
- Standard error: 0.223
- Median: 13,500s
- Standard deviation: 1.094s

The distribution for the results of the "5m shuttle" control test for 6-year-olds is shown both as a percentage and by frequency (graph 13).

Graph 13



Interpreting the quartiles, we can appreciate that 25% of the 6 year olds obtained times < 12.460s (Percentile 25), 50% below the median value (13.500s - Percentile 50), and 25% of the children obtained times greater than 14.195s (Percentile 75).

### 5. Discussions

From the results which have been presented so far we can state several aspects regarding the role of educators who spend a lot of time with children and who they trust and who contributed to the creation of the psycho-pedagogical climate in which the tests took place. Moreover, it should be noted that at these ages children have a different psycho-motor development, progressive and obvious, the values recorded identifying a correlation between indicators of significance.

Also, depending on their age, the proportion of children with minimum results (25%), average results (50%) and higher results (75%) is highlighted, this aspect allowing the orientation towards alpine skiing, of



course cumulatively with other factors that may occur during the training process.

Thus, the interpretations made from the fully recorded data confer the trends of this study which are presented separately and where significant features can be observed regarding the biomotor potential for each age individually.

Biomotor potential, for subjects aged 4-6 years; 103 children tested, 48 girls and 55 boys, with an average age of 4.83 years.

**Age group 4 years:** 41 children, of which 22 girls and 19 boys; the minimum height in this

group was 100 cm (girls) and 102 cm (boys) respectively, while the maximum height was 110 cm in both categories. The weights measured were between 14 and 20 kg in girls and 15 and 22 kg in boys.

*Long jump from a standing position:* 25% of 4-year-olds scored < 55cm; 50% below the median value of 65 cm; 75% of children scored < 85 cm.

*Jumping by turning 360° to the left:* 25% of 4-year-olds scored < 120°; 50% below the median value, 150°; 75% of children scored < 180°.

*Jumping by turning 360° to the right:* 25% of children scored < 100° (25th percentile); 50% below the median value, 150°; 75% of children scored < 180°.

*Shuttle 5m:* 25% of 4-year-olds achieved times < 15.995 sec.; 50% below the median, 17.92 sec.; 75% of children achieved times less than 20.245 sec.

**Age group 5 years:** 38 subjects, 13 girls and 25 boys. The minimum height in this group was 109 cm, while the maximum height was 121 cm in both genders. In terms of weight, it ranged between 16 and 22 kg in girls and 16 and 26 kg in boys.

*Long jump from a standing position:* 25% of children jumped under 40 cm; 50% below the median value, 60 cm; 25% of children jumped > 71.25 cm.

*Jumping by turning 360° to the right:* 25% of 5-year-olds scored < 150°; 50% below the median value, 190°; 25% of children scored > 222.50°.

*Jumping by turning 360° to the left:* 25% of 5-year-olds scored < 145°; 50% below the median value, 180°; 25% of children scored > 220°.

*Shuttle, 5m:* 25% of 5 year olds achieved times < 15.675 sec.; 50% below the median, 18.445 sec.; 25% of children achieved times greater than 20.352 sec.

**Age group 6 years:** 24 subjects, 13 girls and 11 boys. The minimum height in this group was

115 cm for girls and boys. The maximum height was 120 cm in girls and 121 cm in boys. The weight measured was between 19 and 25 kg in girls and 19 and 26 kg in boys.

*Long jump from a standing position:* 25% of 6-year-olds jumped under 70 cm.; 50% below the median value, 90 cm.; 25% of children jumped more than 93.75 cm.

*Jumping by turning 360° to the right: 25% of 6-year-olds scored < 242.50°; 50% below the median value, 270°; 25% of children scored > 315°.*

*Jumping by turning 360° to the left: 25% of 6-year-olds scored < 200°; 50% below the median value, 265°; 25% of children scored > 280°.*

*Shuttle, 5m: 25% of 6 year olds achieved times < 12.460 sec.; 50% below the median, 13,500 sec.; 25% of children achieved times > 14.195 sec.*

## **6. Research limitations**

Due to the fact that the study was conducted on children living near a mountain area, which has the necessary infrastructure for alpine skiing, these standards cannot be applied to other selections specific to sports that take place in completely different conditions from alpine skiing. This study can be seen as an investigation that seeks to identify a projective path of potential alpine skiers and can also create the basis for further research.

## **7. Conclusions**

Obtaining values for the indicators of central tendency (mean, median and module), as highlighted in this paper, confirms the importance of choosing samples that are folded and dosed on the age categories we wish to target and for which we are initiating a selection. Moreover, the series of values obtained and their distributions provide a projection of the level of the groups of children that we will direct towards alpine skiing.

In addition, the skewness indicators (median and quartiles) and the dispersion indicators (dispersion, standard deviation and coefficient of variation) reveal values that allow a synthesis of the morpho-functional indices that the children possess at the time of assessment. These indicators allow the management of future training sessions and direct the resulting development through methodologically and scientifically based training programmes.

The aspects highlighted by processing the results obtained by the children and the values recorded by them support the complexity attributed to the conduct of primary selection in alpine skiing and enhance the importance of directing the correct management of training periods with the major aim of achieving medium and long-term sporting performance.

## **Acknowledgment**

All authors have equal contributions to this work.

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