A cross section study on anthropometry and motor skills in Albanian Special Olympics athletes during 2017: FUN fitness screening test battery

REPORT 2018

Play Unified –Young Athletes

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About

Albanian Sports Science Association (ASSA)

Our history ASSA evolved from the successful and innovative work of Albanian master students "Health and Physical Activity" and was established in 2012 and registered as an association in the Republic of Albania (ASSA organization) located in Tirana.

It was created with the aim of providing scientific information in creating databases on the research environment in Albania, by improving national health and increasing national wealth through scientific information in sports and promotion of physical activity.

ASSA team is proud that the scientific information has and will improve the health of people, increase the quality of sport and will continue to contribute the advancement of sport and health knowledge through scientific research. This center brings together the major stakeholders that influence sport and health sciences research in Albania.

It includes the main research funding bodies; academia; universities; regulatory bodies; the bioscience, healthcare; sports participants and different people willing to participate and promote physical activity.

For more information visit www.assa.al

Introduction

On December 8, 2017 Albanian Sports Science Association (ASSA) had the chance to cooperate with Special Olympics Albania in sport event "Special Olympics Basketball Week 2017" with the support of Kids Sport Center "SMART". During this event ASSA lab team and researches had the opportunity to work with intellectually disabled children within the frameworks of Special Olympics Basketball Week and Physical Activity.

ASSA lab team and researchers had composed a protocol of measurements based on the European Protocol for Special Olympics and protocol for anthropometric measurements and test on children. The activity and testing took place in the premises of Sport University of Tirana.

Protocols of the tests

Measurements and tests were dived into four categories targeting the main areas that contribute in the physical performance of the athlete. A survey that helps determine the demographics of participating athletes was used. Details such as disabilities, frequency of training, and other anthropomorphic measurements were included in the survey. Using the *Timed Stand Test*, ASSA lab team measured the strength of the athletes in 10 repetitions. Using a modified version of the *Single Leg Stance Test*, ASSA lab team measured the ability of the athletes to maintain balance on both right and left legs, with eyes opened and closed. To measure the flexibility of the athletes ASSA team used a modified version of the *Apley's Test* (Functional Shoulder Rotation). The results are calculated below.

A. TIMED STAND TEST – Sit and stand with NO assistance

The timed-stands test is a simple method to quantify functional lower extremity muscle strength (hip and knee extension). The test requires the athlete to complete 10 full stands from a seated position as quickly as possible without the use of the arms.

Mode of administration

1. Have athlete sit on a firm straight-backed chair
2. Use pieces of hard foam or wood to adjust the height of the chair seat and/or to position the feet flat on the floor as necessary to maintain a position with hips and knees at a 90 degree angle.

3. Have the athlete position the arms by the sides with the elbows flexed to 90 degrees. Arms remain in this position for the entire test.
4. Athlete is instructed to "stand from sitting, then sit down again, without using your arms. Repeat this 10 times as quickly as possible."
5. PT demonstrates the test.
6. PT tells the athlete to start with a "ready, set, go."
7. PT, PTA or student stands beside the athlete in case the athlete loses his/her balance during the task.

Scoring

8. PT or PTA starts a stopwatch or timer when he/she says "go."
9. Timer continues until the athlete sits down from the 10th stand.
10. Record the time to perform the task in seconds.

Education: Time greater than 20 seconds or inability to do 10 stands indicates need for education.

B. FUNCTIONAL SHOULDER ROTATION – Modified Apely's test

Participant testing position

1. Athlete stands or sits in a chair, if standing provide a chair or other support for the athlete to hold on to. (Athlete may also sit in a wheelchair.)
2. Athlete is instructed to reach one arm behind the head and down the back, while the other arm reaches behind the hip and up the back.

Physical therapist position

3. PT demonstrates the test.
4. PT then stands behind the athlete.
5. PTA or student stands in front of the athlete for safety.

Measurement

6. PT demonstrates the test position.
7. Athlete is instructed to "try to touch your index fingers together." (one arm is in flexion/abduction/lateral rotation; the other is in extension/adduction/ medial rotation).
8. The measurement is the distance in centimeters between the index fingers

Recording

9. Use a tape measure to measure the distance between the index fingers in centimeters.
10. Determine the side being recorded by the arm on top (i.e., left arm on top = left; right arm on top = right).
11. If the fingertips touch, record the distance as 0 cm.
12. If the fingertips cannot touch, record the separation as negative (e.g., - 15.2 centimeters).
13. If the fingers overlap, record the overlap as positive (e.g., + 2.5 centimeters).
14. Symmetry occurs if each arm reaches equally toward the middle (approximately T7) or at the level of the inferior angle of the scapula.
15. Asymmetry occurs if the arms do not approach the midline evenly (i.e., one arm is more flexible and overreaches the midline, or is less flexible and cannot approximate the midline).
16. Repeat on both sides and record on the score sheet.

Education: Recordings of -16 centimeters to -50 cm. (or more) (e.g., -18 cm.) or asymmetry indicate need for Education.

C. SINGLE LEG STANCE WITH EYES OPEN

The single-leg stance test with ***eyes open*** is a simple method to quantify balance with the assistance of visual cues. The test requires the athlete to stand on one leg with the eyes open. Balance must be maintained as long as possible.

Mode of administration

1. Athlete stands on both legs with feet shoulder width apart.
2. Athlete is placed within arms' reach of a chair for security.
3. The athlete is instructed to place hands on hips.
4. Athlete is instructed to "slowly lift one leg and balance. I will time you until you lose your balance."
5. PT demonstrates the test.
6. PT stands in front of athlete to encourage the athlete to continue without fear of falling. PTA or student stands behind athlete for safety.

7. PT coaches athlete with a “ready, set, now stand on one leg.“
8. Test continues until athlete loses balance, or puts the other foot down (maximum time = 20 seconds).

Scoring

9. PT or PTA starts a stopwatch timer when he/she says “ready, set, now stand on one leg.”
10. Timer continues until balance is lost, or foot of the flexed leg touches the ground.
11. The time completed before loss of balance (up to 20 seconds) is recorded.

Education: Stance time of less than 20 seconds, or asymmetry might indicate need for Education.

The single-leg stance test with ***eyes closed*** is a simple method to quantify balance without the assistance of visual cues. The test requires the participant to stand on one leg, with eyes closed or wearing a blindfold. Balance must be maintained as long as possible.

Mode of administration

1. Athlete stands on both legs with feet shoulder width apart.
2. Athlete is placed within arms’ reach of a chair for security.
3. Hands are placed on hips
4. Arms remain in this position for the entire test.

5. Athlete is requested to “lift one leg, then close your eyes and balance. I will time you until you lose your balance.”
6. A blindfold may be used if the athlete is unable to maintain his/her eyes shut, and only if the athlete agrees to be blindfolded.
7. PT demonstrates the test.
8. PT stands in front of the athlete to encourage the athlete to continue with without fear of falling. PTA or student stands behind athlete for safety.
9. PT coaches the athlete with a “ready, set, stand on one leg, now close your eyes.”

Scoring

10. PT or PTA starts a stopwatch timer when he/she says, “ready, set, stand on one leg, now close your eyes.”
11. Timer continues until balance is lost, or foot of the flexed leg touches the ground.
12. The time completed before loss of balance (up to 10 seconds) is recorded.

Education*:Stance time of fewer than 10 seconds or asymmetry might indicate need for Education.*

Results

Table 1 summarizes the number of participants, their gender and residence. There were 25 boys and 7 girl athletes from 5 participating cities in the event. The mean age and standard deviation of each category, for each participating city is determined in Table 1.

Table 1 Descriptive Statistics for Participants

Gender		*N*	*Mean Age*	*Std. Deviation*
Boy	Tirana	5	17.4	6.7
	Berat	4	27.5	7.5
	Tirana1	6	10.8	3.3
	Elbasan	3	17.0	3.0
	Fier	3	23.0	6.1
	FusheKruje	4	25.8	3.7
Girl	Tirana	1	16.0	
	Berat	3	25.3	9.1
	Tirana1	2	8.5	0.7
	Elbasan	1	13.0	
	Fier	1	19.0	

Table 2 summarizes all the results from all the measurements and test, categorizing the athletes from their resident city.

Table 2-Measured Variables according to Residence

Variable	*Tirana*	*Berat*	*Tirana1*	*Elbasan*	*Fier*	*Fushekruje*
Body_Weight	7	7	8	5	4	6
Waist_Circumference	7	7	8	5	4	6
Flexibility_test_left_up_right_down_LEFT	6	7	6	4	4	4
Flexibility_test_left_up_right_down_RIGHT	6	7	6	4	4	4
Flexibility_test_left_down_right_up_LEFT	6	7	6	4	4	4
Flexibility_test_left_down_right_up_RIGHT	6	7	6	4	4	4
Flexibility_test_left_up_right_down_TOTAL	6	7	6	4	4	4
Flexibility_test_left_down_right_up_TOTAL	5	7	6	4	4	4
Balance_Eyes_Open_right_leg	5	6	5	3	4	1
Balance_Eyes_Open_left_leg	5	6	5	3	4	1
Balance_Eyes_Close_right_leg	5	6	5	3	4	1
Balance_Eyes_Close_left_leg	5	6	5	3	4	1
Timed_Stands_test_10_repetitions	5	7	7	5	4	6

Facts:

- **Overall, participating children do not show high levels of flexibility.**
- **Girls tend to be more flexible than boys.**
- **Athletes tend to be more balanced while maintaining their eyes**

Table 3 calculates the mean and standard deviation for all the measurements and test conducted.

Table 3 Summary of the Measured Variables

Variable	Unit	N	Mean	Std. Deviation
Body_Weight	kg	37	57.6	22.7
Waist_Circumference	cm	37	82.5	19.0
Flexibility_test_left_up_right_down_LEFT	cm	37	-7.2	5.3
Flexibility_test_left_up_right_down_RIGHT	cm	37	-3.2	5.5
Flexibility_test_left_down_right_up_LEFT	cm	37	-4.9	5.0
Flexibility_test_left_down_right_up_RIGHT	cm	37	-3.2	6.1
Flexibility_test_left_up_right_down_TOTAL	cm	37	-10.4	9.3
Flexibility_test_left_down_right_up_TOTAL	cm	36	-8.6	9.4
Balance_Eyes_Open_right_leg	seconds	32	10.7	7.8
Balance_Eyes_Open_left_leg	seconds	32	10.7	7.1
Balance_Eyes_Close_right_leg	seconds	32	6.5	6.1
Balance_Eyes_Close_left_leg	seconds	32	5.3	5.3
Timed_Stands_test_10_repetitions	seconds	39	21.4	5.3

Table 4 calculates the mean and standard deviation for all the measurements and test conducted categorizing athletes by sex.

Table 4 Measured variables by category and gender

		Boys			Girls		
Variable	Unit	N	Mean	Std. Dev	N	Mean	Std. Dev
Body_Weight	kg	28	59.7	23.2	9	51.1	21.2
Waist_Circumference	cm	28	83.7	20.8	9	78.8	11.8
Flexibility_test_left_up_right_down_LEFT	cm	23	-8.3	5.7	8	-5.8	4.1
Flexibility_test_left_up_right_down_RIGHT	cm	23	-3.8	6.4	8	-3.3	4.2
Flexibility_test_left_down_right_up_LEFT	cm	23	-5.3	5.1	8	-5.9	5.6
Flexibility_test_left_down_right_up_RIGHT	cm	23	-4.5	6.8	8	-1.4	4.4
Flexibility_test_left_up_right_down_TOTAL	cm	23	-12.2	10.4	8	-9.0	7.5
Flexibility_test_left_down_right_up_TOTAL	cm	22	-10.1	10.6	8	-9.0	7.2
Balance_Eyes_Open_right_leg	seconds	17	10.4	8.0	7	11.4	7.9
Balance_Eyes_Open_left_leg	seconds	17	9.6	7.4	7	10.7	6.6
Balance_Eyes_Close_right_leg	seconds	17	5.9	5.8	7	6.1	6.6
Balance_Eyes_Close_left_leg	seconds	17	4.4	4.2	7	5.9	6.9
Timed_Stands_test_10_repetitions	seconds	26	22.5	5.9	8	20.4	3.5

Table 5 calculates the mean and standard deviation for all the measurements and test conducted categorizing athletes by their resident city.

Table 5 Measured variables, Category: Residence

Variable	Unit	Tirana	Berat	Tirana	Elbasan	Fier	Fushe - Kruje
Body_Weight	kg	69.0	54.5	40.1	63.2	71.5	57.3
Waist_Circumference	cm	94.7	80.1	73.5	83.2	96.5	73.0
Flexibility_test_left_up_right_down_LEFT	cm	-8.8	-6.0	-7.7	-8.0	-5.0	-11.0
Flexibility_test_left_up_right_down_RIGHT	cm	1.0	-6.0	-3.0	-1.8	-3.0	-10.3
Flexibility_test_left_down_right_up_LEFT	cm	-5.2	-6.9	-4.5	-4.3	-4.5	-7.3
Flexibility_test_left_down_right_up_RIGHT	cm	0.3	-2.7	-3.2	-7.0	-3.0	-9.5
Flexibility_test_left_up_right_down_TOTAL	cm	-7.8	-12.0	-10.8	-9.8	-8.0	-21.3
Flexibility_test_left_down_right_up_TOTAL	cm	-8.0	-9.6	-7.7	-11.3	-7.5	-16.8
Balance_Eyes_Open_right_leg	seconds	14.2	12.0	4.6	18.0	3.8	21.0
Balance_Eyes_Open_left_leg	seconds	14.8	8.8	4.6	18.0	3.3	21.0
Balance_Eyes_Close_right_leg	seconds	6.8	7.0	2.2	13.0	4.0	2.0
Balance_Eyes_Close_left_leg	seconds	8.0	4.3	1.4	11.7	1.8	2.0
Timed_Stands_test_10_repetitions	seconds	21.2	22.3	22.9	19.0	27.2	20.2

Facts:

- **No major external indicators are observed in during measurements.**
- **86% of the athletes can easily perform simple stretching exercises.**
- **Girls are more prone to falling, 89% as opposed to 67% for boys.**

Table 6 and 7 summarize the difficulties that may interfere in the measurements and change the results.

Table 6 Physical problems with athletes (N)

Problems	N	*Boys*	*Girls*
No	35	28	9
Stomach	1	1	0
Hunchbacked	1	1	0
Total	37	30	9

Table 7 Physical problems with athletes (%)

Problems	%	*Boys*	*Girls*
No	95	93	100
Stomach	3	3	0
Hunchbacked	3	3	0
Total	100	100	100

Table 8 and 9 summarize the ability of the participants to perform simple stretching exercises.86% of the children are able to perform simple stretching exercises, with boys being slightly more flexible than girls. Only 14% of the children fail to perform simple stretching exercises.

Table 8 Ability to stretch (N)

Able to Stretch	N	***Boys***	***Girls***
No	5	4	1
Yes	30	22	8
Total	35	26	9

Table 9 Ability to stretch (%)

Able to Stretch	%	***Boys***	***Girls***
No	14	15	11
Yes	86	85	89
Total	100	100	100

Table 10 and 11 summarize the answer to the question: "Have you fallen in the past year in your home?" Participating athletes have had accidences were they fell in their home, at least once, as 72% of them answered "yes".

Table 10 The tendency to fall (N)

Have you fallen in the past year in your home?	N	***Boys***	***Girls***
No	10	9	1
Yes	26	18	8
Total	36	27	9

Table 11 The tendency to fall (%)

Have you fallen in the past year in your home?	%	***Boys***	***Girls***
No	28	33	11
Yes	72	67	89
Total	100	100	100

Facts:

- **More than 20% of the participants perform physical activity more than once a week.**
- **Boys tend to get included in physical activities, in general, more than 3 times per week and girl no more than 2-3 times per week.**

Tables below measure the frequency of physical activity involvement throughout the week for the participating athletes, as well as their participation on related Special Olympic training.

Data from tables 12 and 13 show that: 39% of the children perform physical activities 4-7 days a week. Meanwhile 35% of the children perform physical activities 2-3 days a week. 26% of the children do not engage themselves in physical activities or their physical days are limited to once a week.

Table 12 Weekly physical activity indicators (N)

PA per week	N	Boys	Girls
0	2	2	0
1 day	7	5	2
2 days	3	1	2
3 days	9	6	3
4 days	0	0	0
5 days	10	8	2
6 days	0	0	0
7 days	4	4	0
Total	35	26	9

Table 13 Weekly physical activity indicators (%)

PA per week	%	Boys	Girls
0	6	8	0
1 day	20	19	22
2 days	9	4	22
3 days	26	23	33
4 days	0	0	0
5 days	29	31	22
6 days	0	0	0

7 days	11	15	0
Total	100	100	100

Data from tables 14 and 15 show the involvement of the children in the activities organized by Special Olympics Albania. Only 3% of the children have not been involved in SOA activities. 97% of them have been part of Special Olympic Albania activities.

Table 14 SO participation (N)

SO trainning	N	*Boys*	*Girls*
None	1	1	0
Some	20	12	8
Most	13	12	1
All	0	0	0
Total	34	25	9

Table 15 SO participation (%)

SO training	%	*Boys*	*Girls*
None	3	4	0
Some	59	48	89
Most	38	48	11
All	0	0	0
Total	100	100	100

Facts:

- **Participating athletes tend to get included in the Social Olympics activities most of the time, with boys (48%) being more included than girls (11%).**

Discussion

In general, there exists a pleasing approach to physical activity and healthy lifestyle. Children are not unfamiliar with training, performing physical activities (including specific sports) and participating in sportive events. However specific sections on their training and physical activity involvement leave room for improvement.

Beginning with their involvement in physical activities: data shows that 27% of the children are limited from physical activities, or they only train once a week. Special Olympics Albania contributes to spreading social inclusion and the role physical activity plays in a healthy lifestyle (97% of children are included in SO activities).

Trainers should also focus in specific abilities such as strength, balance or flexibility. While the majority of children are able to perform simple general flexibility exercises (86%), they fail to perform specific flexibility tasks (*Functional shoulder rotation – Table 2*). Other data show that girls perform better in balance exercises and boys in strength indicators. Trainers should make sure to narrow this gender gap.

Periodical tests and measurements must be taken, in order to maintain relatively good physical health indicators.

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