

ASYMPTOMATIC STABILITY AND SEXUAL DIMORPHISM OF STUDENTS OF THE RZESZÓW UNIVERSITY

Marian **RZEPKO**^{1ABCG}, Sławomir **DROZD**^{1ABCD}, Wojciech **BAJOREK**^{1ABG},
Wojciech **CZARNY**^{1AC}, Paweł **KRÓL**^{1ABG}, Piotr **KUNYSZ**^{2ACG},
Joanna **WÓJTOWICZ**^{1ABDG}

1. Faculty of Physical Education, University of Rzeszow, Rzeszow, Poland
2. Academy of Physical Education in Wroclaw , Poland

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Abstract:

The balance and the stability are playing very important role in sport, since competitors often use both of these features of putting the body in order to get the good result of one's action. At the work are presented findings of the research of 10 women and 10 men after 20 year of age from the Department of the physical education of the Rzeszów University. In standing position was used a dynamometrical AccuGait platform for the evaluation of keeping its balance. Authors of the work notice, that comparing results conducted in the course of training camp to results carried out at the end, the group of women demonstrated parameters largely lowering of value of indicators both in the OO attempt as well as OZ. Comparing the results achieved during and at the end of the skiing training in the male group, it is possible to notice , that the majority of parameters is characterized by an increase in number in the OO attempt and at OZ.

INTRODUCTION

The physical activity of the man can be seen in movement activities among which the possibility of holding and controlling the vertical position of the body which constitutes the starting base for locomotive duties, determining the mobility of the man [of Golem M., 2002.].

The control of the body is regarding the guidance with attitude, that is granting the body the determined profile. However keeping the balance of the body upright bodies are an ability to oppose effects of different interferences [Błaszczyk J., 2004]

A balance is a determined state of the postural arrangement being characterized by a vertical sense of direction of the body achieved by balancing powers working on the body and their moments. It is characterized by the fact that the body is sitting down or will move the uniform motion. Balancing outside powers, sum of moments of powers, preserved balance of moments of powers, size of the surface of the base, height of the centre of gravity are conditions of keeping their balance (OSC) and the size of the angle of the balance or stabilities [Reszel W., 2009]

Keeping one's balance in standing position is regarding physical properties of hesitations of the body and physical properties of movements correcting the process of keeping their balance. Transferring the body, that is shaking out, from properties of the pendulum turned away and the work of the muscles responsible for keeping the vertical position of the body. Hesitations are the cause of movements which are keeping the vertical

position. Performances of movements restoring the steady-state are causing hesitations [Golem M., 1987]

The stability refers to the problem of leading out the body of the steady state. The stability of the body is all the greater, it is harder to disturb its steady-state (i.e. to lead them out of this state). In other words a stability of the attitude is an ability of the organism to regain the appointed position in the space after the effect of the destabilizing stimulus. The own motor activity of the organism or outside powers appearing as a result of interaction with surroundings can be a destabilizing factor. [Polechoński J., 2007., acoustic Stimuli and the stability of the attitude of the body, AWF, Katowice, p. 89.]

A body weight, a base of the body and more low situating the centre of gravity are affecting the better stability (more close to the base) [Grimshaw P., Lees A., Fowler N., Burden A., 2010]

The balance and the stability are playing very important role in sport, since competitors often use both of these features of putting the body in order to get the good result of one's action.

Balance disorders can lead to the postural instability which it is possible to define as irreparable losing the balance during the inactive position, when means of the body weight are going beyond the plain of the support.

At people the sexual dimorphism is slight in the baby period, more distinct pre-school and school, distinct at puberty. With dimorphism (gr. dymorphos = dwukształtny) we are calling sexual phenomenon of the different pace of development and the size of somatic features at both of sex [Januszewski J., vermilion Flycatcher J., 1995]. They are examples: the highest growth, proliferation of the pectoral girdle, longer limbs at men, the greater proliferation of the pelvis and oblique placing hip bearings, the proliferation of mammary glands and the ampler subcutaneous fatty tissue of women.

Phenomenon of the sexual dimorphism in the physical culture, mainly in the professional sport and recreational has a great significance. Differences of the size of somatic features and functional properties between men and women are creating the ground for diversifying the possibilities of both representatives of sex [Eksterowicz J., Napierała M., Zukow W., 2013]

PURPOSE OF THE WORK

Determining the influence of the sexual dimorphism on the stability was a purpose of non-symptomatic research of students of Rzeszów University of the Department of the physical education staying on a ski camp.

MATERIAL AND TESTING METHODS

At the work are presented findings of the research of 10 women and 10 men after 20 year of age from the Department of the physical education of the Rzeszów University. Examinations were conducted in the course of lasting the training camp which took place in Krynica Zdrój in an autumn semester of academic year 2011 / 2012. Examined students were subjected to a two-week ski training on the basic level. A group participating in the examination is persons about the higher physical fitness, because these are students of the Department of the physical education. Persons provided with the examination stayed on the skiing training. The camp altogether lasted 14 days and in every day students spent 6 hours on the slope, where took place classes in the downhill skiing . At the camp apart from the program of basic classes, i.e. the skiing appropriate training they had additional classes. It is possible to rank the morning jogging as well as classes at the hidden skating rink among additional classes, where students went on skate 3 times in the course of lasting a ski camp.

Training program was modeled on the training program of affiliating Instructors and Coaches of the Skiing - SITN.

Two measurements concerning the ability to keep its balance were performed. The first results took place in the course of lasting the camp, however second in final. Mentioned above measurements were conducted in the same conditions. The time of the conducted measurement amounted to 30 seconds: first with opened eyes, second with eyes shut in the same position.

In standing position was used a dynamometrical AccuGait platform for the evaluation of keeping its balance. The examination was performed after the rest of few minutes, next the athlete was asked for going up the platform and free standing, where upper limbs were arranged along the body, barefooted arranged parallel feet.

FINDINGS

In examinations conducted by authors on the group of students and students from Rzeszów University of the Department of the physical education, the analysis of the results showed differences which are appearing between values of parameters of opened eyes and values of parameters of closed eyes.

Table 1. Changeability of basic parameters of statistical women in the course of lasting a ski camp. Examination I - free standing opened eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	3,168	-1,2	0,459	5,272
COP-Y Avg (cm.)	2,336	-11,357	-3,532	10,906
COP-X Max (cm.)	4,188	0,211	1,083	4,64
COP-X Min (cm.)	-0,439	-3,916	-1,081	3,779
COP-Y Max (cm.)	11,357	0,801	2,797	10,511
COP-Y Min (cm.)	-0,597	-7,772	-1,883	7,441
95% Ellipse Area (cm..cm.)	14,491	0,704	2,7	12,831
Length	95,885	34,328	48,58	56,803

In the course of the conducted first examination an arithmetic average of the value of the course of putting the COP point in the coronal plane was get (COP-X Avg) in the maximum scope 3.168 minimum value it -1.2 arithmetic average (Avg) took out 0.459 however value of the standard deviation (SD) took out 5.272. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average is taking out at the maximum value 2.336 at the minimum value -11.357. Arithmetic average (Avg) is -3.532 however value of the standard deviation (SD) it 10.906. For the scope of the course of putting the COP point in the coronal plane (COP-X Max) a maximum value was get in the scope 4.188. Minimum value it 0.211. Arithmetic average(Avg) is 1.083. Standard deviation (SD) is taking out 4.64. The minimal scope of the course of putting the COP point in the coronal plane (COP-Min) was entered into in the maximum scope -0.439 in the minimal scope -3.916, arithmetic average value is -1.081 however standard deviation it 3.779. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 11.357 minimum value 0.801 however the arithmetic average was 2.797 cm a standard deviation is a value 10.511. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope -0.597, minimal - 7.772, arithmetic average is -1.883 and standard deviation is 7.441. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 14.491, minimal

0.704. The determined arithmetic average became a value 2.7 however the standard deviation was determined with value 12.831. Parameter of the total length of the path (Length) took out in the maximum scope 95.885, minimal 34.328. Arithmetic average of the path is 48.58 and standard deviation is 56.803.

Graph 1. Changeability of basic parameters of statistical women in the course of lasting a ski camp. Examination I - free standing opened eyes.

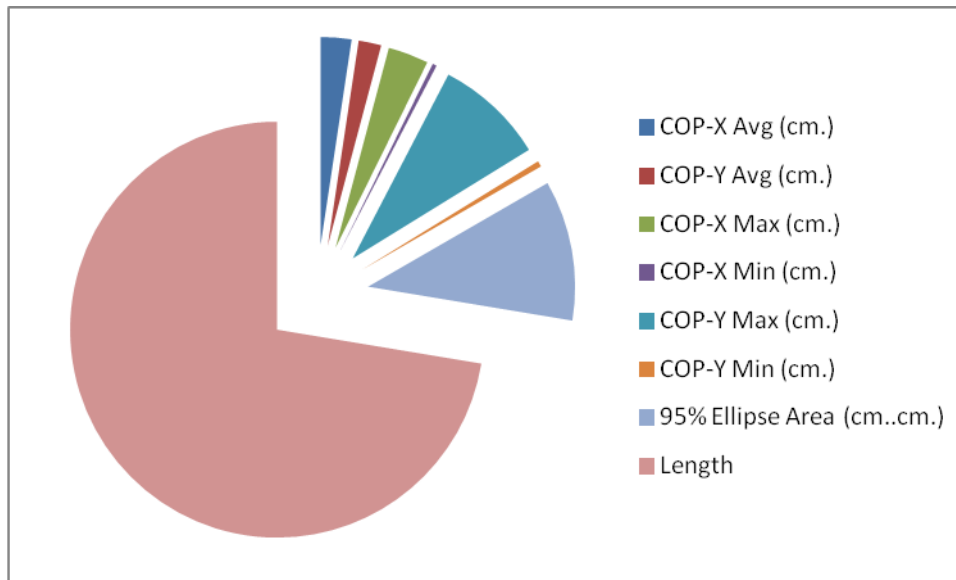


Table 4. Changeability of basic parameters of statistical women in the course of lasting a ski camp. The II examination - free standing closed eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	3,327	-1,461	0,434	5,385
COP-Y Avg (cm.)	1,282	-11,14	-3,584	10,655
COP-X Max (cm.)	1,631	0,245	0,649	1,546
COP-X Min (cm.)	-0,208	-1,304	-0,672	1,396
COP-Y Max (cm.)	2,545	0,406	1,197	2,263
COP-Y Min (cm.)	-0,407	-1,99	-1,072	1,725
95% Ellipse Area (cm..cm.)	4,87	0,335	1,799	5,863
Length	78,054	31,88	51,03	51,174

(Source: based on own examinations)

In the second examination an arithmetic average of the value of the course of putting the COP point in the coronal plane was (COP-X Avg) in the maximum scope 3.327. Minimum value is -1.461, arithmetic average (Avg) took out 0.434 however value of the standard deviation (SD) took out 5.385. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average is taking out at the maximum value 1.282, at the minimum value -11.14. Arithmetic average(Avg) is -3.584 however value of the standard deviation (SD) is 10.655. For the maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) a maximum value was in the scope 1.631. Minimum value is 0.245. Arithmetic average (Avg) is 0.649. Standard deviation (SD) is taking out 1.546. The minimal scope of the course of putting the COP point in the coronal plane (COP-X Min) was entered into in the maximum scope -0.208 in the minimal scope -1.304, arithmetic average value is -0.672, however standard deviation it 1.396. The maximum course of putting the COP point in the

fibular plain (COP-Y Max) was entered into in the maximum value 2.545 minimum value 0.406 however the arithmetic average was 1.197 cm a standard deviation is a value 2.263. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope -0.407, minimal -1.99, arithmetic average is -1.072 and standard deviation in the scope 1.725. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 4.87, minimal 0.335. The determined arithmetic average became a value 1.799, however the standard deviation was determined with value 5.863. Parameter of the total length of the path (Length) took out in the maximum scope 78.054, minimal 31.88. Arithmetic average of the length of the path is 51.03 and standard deviation is 51.174.

Graph 2. Changeability of basic parameters of statistical women in the course of lasting a ski camp. The II examination - free standing closed eyes.

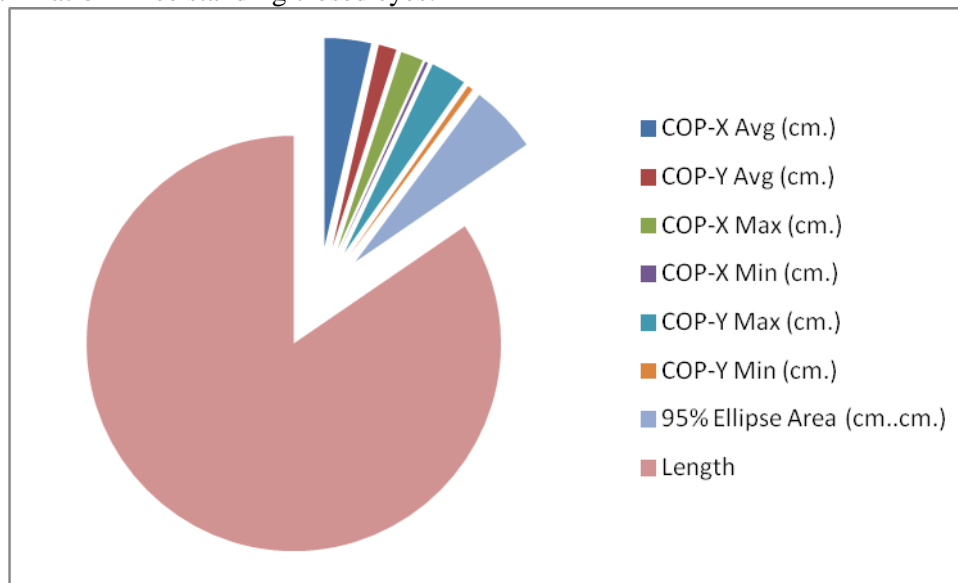


Table 5. Changeability of basic parameters of statistical men in the course of lasting a ski camp. The III examination - free standing opened eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	3,013	-1,258	0,35	3,656
COP-Y Avg (cm.)	0,11	-7,397	-4,243	7,545
COP-X Max (cm.)	1,068	0,364	0,64	0,638
COP-X Min (cm.)	-0,362	-1,503	-0,722	1,024
COP-Y Max (cm.)	1,534	0,517	1,055	1,015
COP-Y Min (cm.)	-0,594	-1,608	-0,975	0,986
95% Ellipse Area (cm..cm.)	3,79	0,744	1,821	2,635
Length	47,806	33,8	41,057	15,23

(Source: based on own examinations)

The third examination was conducted in the male group while lasting a ski camp. As a result of the research were got parameters in the arithmetic average of the value of the course of putting the COP point in the coronal plane (COP-X Avg) in the maximum scope 3.013. The minimum value is fluctuating within the limits of -1.258. Arithmetic average (Avg) took out 0.35 however value of the standard deviation (SD) took out 3.656. Course of putting the

COP point in the fibular plain (COP-Y Avg) in the scope of the arithmetic average took out at the maximum value 0.11 at the minimum value -7.397. Arithmetic average (Avg) is -4.243 however value of the standard deviation (SD) is 7.545. Maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) entered itself into the maximum value in the scope of 1.068. The minimum value is 0.364. Arithmetic average (Avg) is 0.64. Standard deviation (SD) is taking out 0.638. The minimal scope of the course of putting the COP point in the coronal plane (COP-X min) was entered into in the maximum scope -0.362, in the minimal scope -1.503, arithmetic average value is -0.722 however standard deviation is 1.024. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 1.534, minimum value is 0.517. However the arithmetic average was 1.055 cm a standard deviation is a value 1.015. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope -0.594, minimal -1,608 arithmetic average is -0.975 and standard deviation in the scope of 0.986. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 3.79 minimal 0.744. The arithmetic mean was determined with a value 1.821 however the standard deviation was determined with value 2.635. Parameter of the total length of the path (Length) took out in the maximum scope 47.806, minimal 33.8. Arithmetic average of the length of the path is 41.057 and standard deviation is 15.23.

Graph 3. Changeability of basic parameters of statistical men in the course of lasting a ski camp. The III examination - free standing opened eyes.

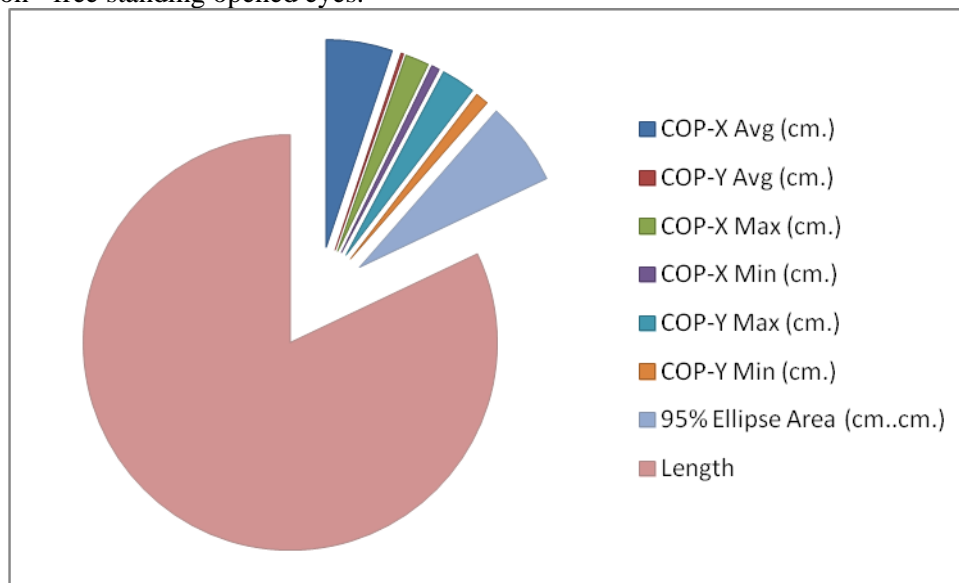


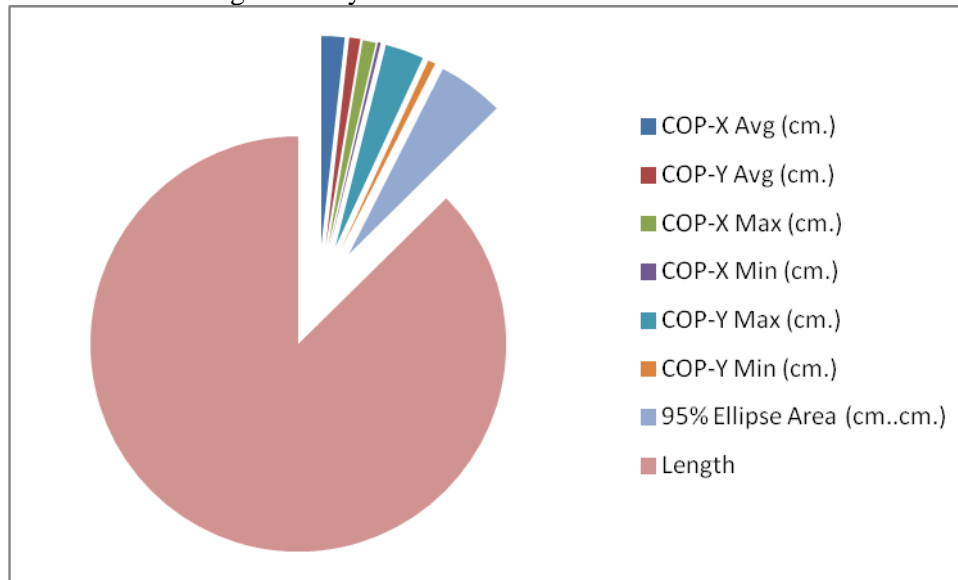
Table 6. Changeability of basic parameters of statistical men in the course of lasting a ski camp. The IV examination - free standing closed eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	2,327	-1,688	0,211	3,331
COP-Y Avg (cm.)	1,105	-6,588	-3,38	7,656
COP-X Max (cm.)	1,321	0,301	0,748	1,067
COP-X Min (cm.)	-0,296	-2,21	-0,836	1,921
COP-Y Max (cm.)	3,878	0,684	1,735	2,932
COP-Y Min (cm.)	-0,754	-2,917	-1,417	1,911
95% Ellipse Area (cm..cm.)	6,648	0,835	2,804	6,5
Length	112,946	34,642	64,187	83,986

(Source: based on own examinations)

In the fourth examination conducted in the same male group, were got parameters in the arithmetic average of the value of the course of putting the COP point in the coronal plane (COP-X Avg) in the maximum scope 2.327. The minimum value is fluctuating within the limits of -1.688 arithmetic average (Avg) was out 0.211 however value of the standard deviation (SD) was 3.331. The course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average was at the maximum value 0.105 at the minimum value -6.588. Arithmetic average (Avg) is -3.38 however value of the standard deviation (SD) is 7.656. Maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) entered itself into the maximum value 1.321. Minimum value is 0.301. Arithmetic average (Avg) is 0.748. Standard deviation (SD) is taking out 1.067. The minimal scope of the course of putting the COP point in the coronal plane (COP-X min) was entered into in the maximum scope -0.296 in the minimal scope -2.21, arithmetic average value is -0.836 however standard deviation is 1.921. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 3.878, minimum value is 0.684. However the arithmetic average was 1.735 cm a standard deviation is a value 2.932. For the minimum course of putting the COP point in the fibular plain (COP-Y min), parameters were in the maximum scope -0.754, minimal -2.917, arithmetic average is -1.417 and standard deviation is 1.911. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 6.648, minimal 0.835. The determined arithmetic average became a value 2.804 however the standard deviation was determined with value 6.5. Parameter of the total length of the path (Length) took out in the maximum scope 112.946, minimal 34.642. Arithmetic average was 64.187 and standard deviation is 83.986.

Graph 4. Changeability of basic parameters of statistical men in the course of lasting a ski camp. The IV examination - free standing closed eyes.



CONCLUSION:

In examinations conducted by the author on the group of students from Rzeszów University of the Department of the physical education, the analysis of the results showed differences which are appearing between group results of women and group results of men. In the course of lasting a ski camp performed measurements with opened eyes, in which it is possible to observe that total length of the footpath in the group of women, most of

parameters is higher in comparing to men. Similar results were obtained at the end of lasting a ski camp in parameters with OO. in examining with closed eyes was received the inverse .

Table 7. Changeability of basic parameters of statistical women at the end of lasting a ski camp. The V examination - free standing opened eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	3,337	-0,585	0,747	4,146
COP-Y Avg (cm.)	-0,656	-6,961	-3,456	7,849
COP-X Max (cm.)	1,256	0,24	0,609	1,318
COP-X Min (cm.)	-0,358	-3,337	-1,159	3,44
COP-Y Max (cm.)	6,961	0,593	2,597	7,571
COP-Y Min (cm.)	-0,574	-5,666	-2,014	6,552
95% Ellipse Area (cm..cm.)	6,544	0,709	2,661	7,047
Length	77,513	32,158	48,755	43,653

(Source: based on own examinations)

In the course of the fifth examination conducted under the angle of the changeability of basic statistical parameters in the female group, parameters in the arithmetic average of the value of the course of putting the COP point in the coronal plane (COP-X Avg) in the maximum scope 3.337. The minimum value fluctuated within the limits of -0.585. Arithmetic average (Avg) took out 0.747 however value of the standard deviation (SD) took out 4.146. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average took out at the maximum value -0.656 at the minimum value -6.961. Arithmetic average (Avg) is -3.456 however value of the standard deviation (SD) is 7.849. Maximum of scope of the course of putting the COP point in the coronal plane (COP-X Max) entered the maximum value in the scope 1.256. Minimum value it 0.24. Arithmetic average (Avg) is 0.609. Standard deviation (SD) is taking out 1.318. The minimal scope of the course of putting the COP point in the coronal plane (COP-X min) was entered into in the maximum scope -0.358 in the minimal scope -3.337, arithmetic average value is -1.159 however standard deviation is 3.44. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 6.961, minimum value is 0.593. However the arithmetic average was 2.597 cm a standard deviation is a value 7.571. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope - 0.574; minimal -5.666; arithmetic average is -2.014 and standard deviation in the scope of 6.552. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 6.544; minimal 0.709. The determined arithmetic average became a value 2.661 however the standard deviation was 7.047. Parameter of the total length of the path (Length) took out in the maximum scope 77.513 minimal 32.158. Arithmetic average is 48.755 and standard deviation is 43.653.

Graph 5. Changeability of basic parameters of statistical women at the end of lasting a ski camp. The V examination - free standing opened eyes.

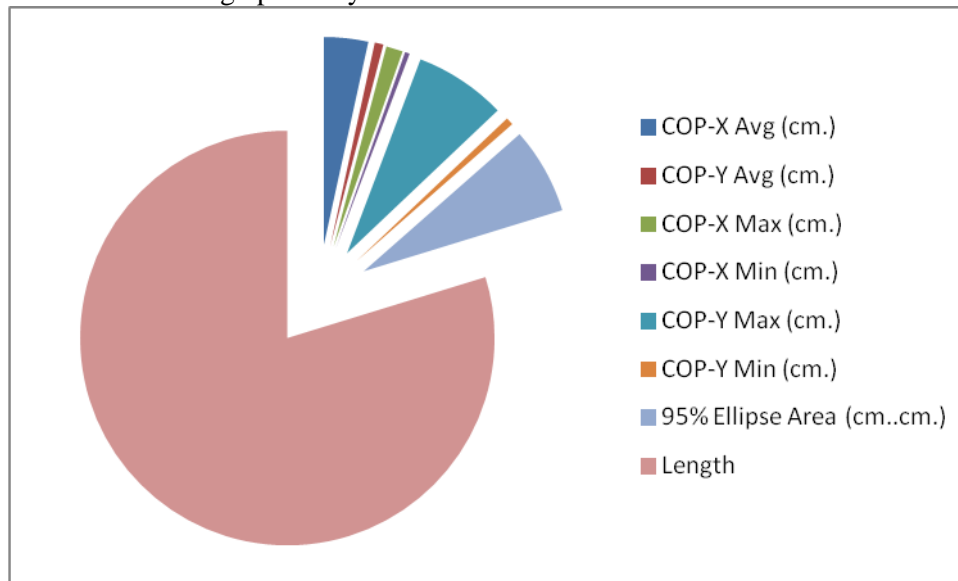


Table 8. Changeability of basic parameters of statistical women at the end of lasting a ski camp. The VI examination - free standing closed eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	3,815	-0,816	0,65	4,817
COP-Y Avg (cm.)	-0,958	-7,326	-3,954	7,82
COP-X Max (cm.)	1,275	0,205	0,603	1,18
COP-X Min (cm.)	-0,247	-2,135	-0,644	1,687
COP-Y Max (cm.)	2,301	0,666	1,085	1,474
COP-Y Min (cm.)	-0,536	-2,453	-1,193	2,239
95% Ellipse Area (cm..cm.)	10,195	0,502	1,993	8,879
Length	61,038	35,349	48,115	33,909

(Source: based on own examinations)

The sixth examination conducted under the angle of the changeability of basic statistical parameters in the female group, permitted the value of the course of putting the COP point in the coronal plane getting parameters in the arithmetic average (COP-X Avg) in the maximum scope 3.815. The minimum value fluctuated within the limits of -0.816. Arithmetic average (Avg) took out 0.65 however value of the standard deviation (SD) took out 4.817. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average took out at the maximum value -0.958, at the minimum value -7.326. Arithmetic average (Avg) is -3.954 however value of the standard deviation (SD) is 7.82. The maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) was in the maximum value in the scope of 1.275. Minimum value is 0.205. Arithmetic average (Avg) is 0.603. Standard deviation (SD) is taking out 1.18. The minimal scope of the course of putting the COP point in the coronal plane (COP-X Min) was entered into in the maximum scope -0.247; in the minimal scope -2.135; arithmetic average is -0.644 however standard deviation is 1.687. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 2.301 minimum value is 0.666. However the arithmetic average was 1.085 cm a standard deviation is a value 1.474. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were -0.536; minimal -2.453; arithmetic

average is -1.193 and standard deviation is 2.239. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 10.195; minimal 0.502. The determined arithmetic average became a value 1.993 however the standard deviation was 8.879. Parameter of the total length of the path (Length) took out in the maximum scope 61.038; minimal 35.349. Arithmetic average of the path length is 48.115 and standard deviation is 33.909.

Graph 6. Changeability of basic parameters of statistical women at the end of lasting a ski camp. The VI examination - free standing closed eyes.

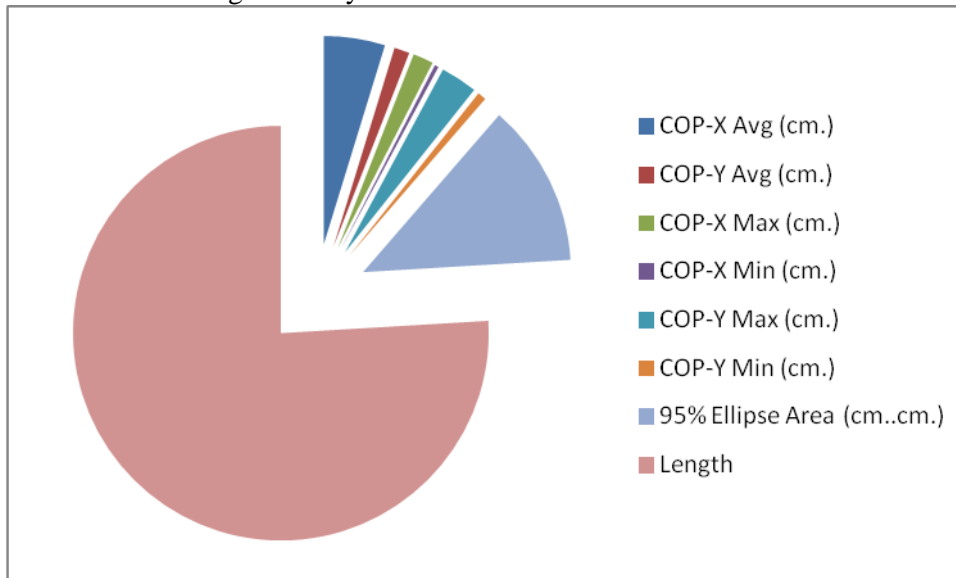


Table 9. Changeability of basic parameters of statistical men at the end of lasting a ski camp. The VII examination - free standing opened eyes.

Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	2,89	-0,16	1,137	2,887
COP-Y Avg (cm.)	1,411	-7,813	-3,544	7,871
COP-X Max (cm.)	1,184	0,413	0,752	0,864
COP-X Min (cm.)	-0,321	-3,309	-1,156	2,729
COP-Y Max (cm.)	13,339	0,865	3,171	11,477
COP-Y Min (cm.)	-0,561	-2,737	-1,28	1,946
95% Ellipse Area (cm..cm.)	6,505	1,022	2,636	5,719
Length	68,913	34,985	47,127	30,918

(Source: based on own examinations)

During the seventh conducted examining in the male group under the angle of the changeability of basic statistical parameters, parameters were get in the arithmetic average of the value of the course of putting the COP point in the coronal plane (COP-X Avg) in the maximum scope 2.89. The minimum value fluctuated within the limits of -0.16. Arithmetic average (Avg) took out 1.137 however value of the standard deviation (SD) took out 2.887. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average

was at the maximum value 1.411, at the minimum value -7.813. Arithmetic average (Avg) is-3.544 however value of the standard deviation (SD) is 7.871. The maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) got the maximum value in the scope of 1.184. Minimum value is 0.413. Arithmetic average (Avg) it 0.752. Standard deviation (SD) is taking out 0.864. The minimal scope of the course of putting the COP point in the coronal plane (COP-X Min) was entered into in the maximum scope -0.321; in the minimal scope -3.309; arithmetic average is -1.156 however standard deviation is 2.729. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 13.339; minimum value is 0.865. However the arithmetic average was 3.171 cm a standard deviation is a value 11.477. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope -0.561; minimal -2.737; arithmetic average iis -1.28 and standard deviation in the scope of 1.946. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 6.505 minimal 1.022. The determined arithmetic average became a value 2.636 however the standard deviation was 5.719. Parameter of the total length of the path (Length) took out in the maximum scope 68.913; minimal 34.985. Arithmetic average of the length of the path was 47.127 and standard deviation 30.918.

Graph 7. Changeability of basic parameters of statistical men at the end of lasting a ski camp. The VII examination - free standing opened eyes.

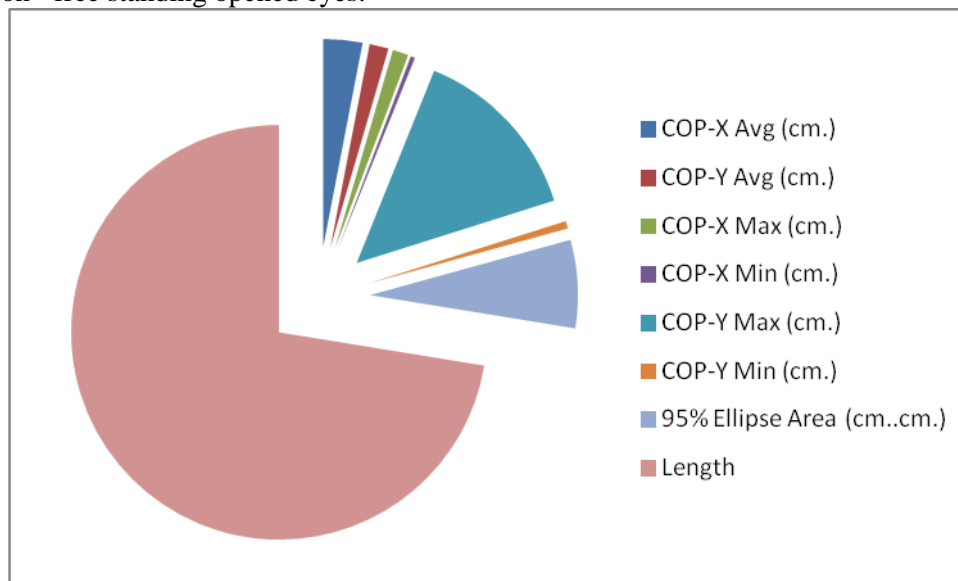


Table10.

Changeability of basic parameters of statistical men at the end of lasting a ski camp. The VIII examination - free standing closed eyes.

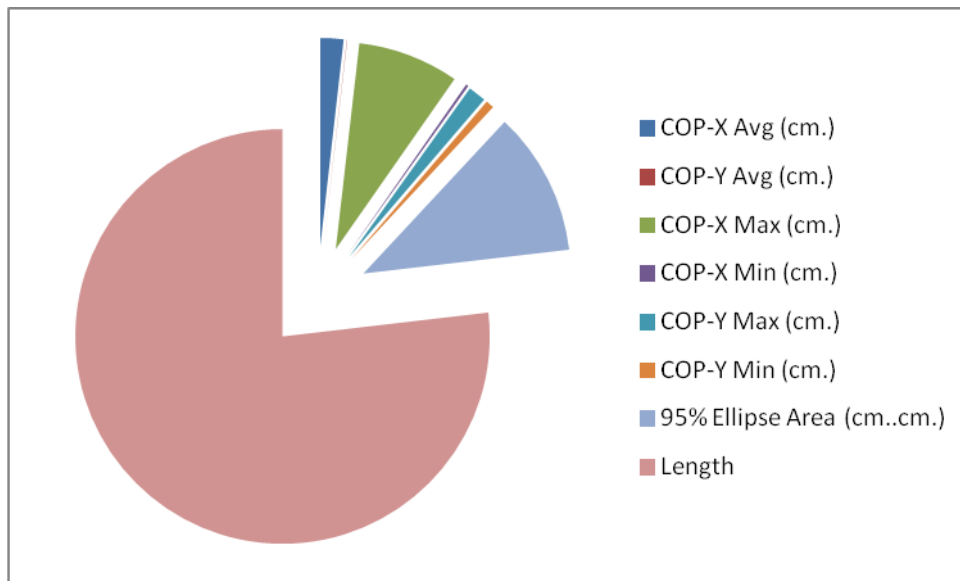
Parameters	Max	Min	Avg	SD
COP-X Avg (cm.)	2,671	-0,285	1,194	2,556
COP-Y Avg (cm.)	0,039	-6,864	-3,004	6,558
COP-X Max (cm.)	11,75	0,315	3,411	11,21
COP-X Min (cm.)	-0,29	-3,822	-1,143	2,98
COP-Y Max (cm.)	2,086	1,161	1,604	0,857
COP-Y Min (cm.)	-0,953	-2,397	-1,554	1,167
95% Ellipse Area (cm..cm.)	16,727	0,787	4,887	13,842
Length	114,539	39,965	66,058	75,289

(Source: based on own examinations)

In the eighth examination conducted in the male group, were got parameters in the arithmetic average of the value of the course of putting the COP point in the coronal plane (COP-X Avg) in the maximum scope 2.671. The minimum value fluctuated within the limits of -0.285. Arithmetic average (Avg) took out 1.194 however value of the standard deviation (SD) took out 2.556. Course of putting the COP point in the fibular plain (COP-Y Avg) in the arithmetic average took out at the maximum value 0.039, at the minimum value -6.864. Arithmetic average (Avg) is -3.004 however value of the standard deviation (SD) is 6.558. The maximum scope of the course of putting the COP point in the coronal plane (COP-X Max) entered into the maximum value in the scope of 11.75. Minimum value is 0.315. Arithmetic average (Avg) is 3.411. Standard deviation (SD) is taking out 11.21. The minimal scope of the course of putting the COP point in the coronal plane (COP-X Min) was entered into in the maximum scope -0.29 in the minimal scope -3.822; arithmetic average value is -1.143 however standard deviation is 2.98. The maximum course of putting the COP point in the fibular plain (COP-Y Max) was entered into in the maximum value 2.086; minimum value is 1.161. However the arithmetic mean was 1.604 cm a standard deviation is a value 0.857. For the minimum course of putting the COP point in the fibular plain (COP-Y Min) parameters were get in the maximum scope -0.953; minimal -2.397; arithmetic average is -1.554 and standard deviation in the scope of 1.167. Parameters of Pol of the Ellipse of the 95% of the confidence - were entered into in the maximum value 16.727 minimal 0.787. The determined arithmetic average became a value 4.887 however the standard deviation was determined values 13.842. Parameter of the total length of the path (Length) took out in the maximum scope 114.539; minimal 39.965. Arithmetic average of the length of the path 66.058 and a standard deviation is a value 75.289.

Graph 8.

Changeability of basic parameters of statistical men at the end of lasting a ski camp. The VIII examination - free standing closed eyes.



THE SUMMARY AND DISCUSSION

Dimorphic differences are seen already in the period of the foetal life, are growing in the course of the progressive development and most strongly are stressed at individuals of adults what are confirming examinations Bednarska1983, Cieřlik and others 1994, Drozdowski 1994, Promińska 1987 behind Wojtyna J., Rodziewicz-Gruhn J. [Wojtyna J., Rodziewicz-Gruhn J., 2005, dimorphic diversifying characteristics of morphological candidates for studies of the physical education in WSP in Częstochowa in academic year 1996 / 1997, Słupsk Biological Works No. 1.]

In examinations conducted by authors on the group of students from Rzeszów University of the Department of the physical education, the analysis of the results showed differences which are appearing between group results of women and group results of men. In the course of lasting a ski camp measurements were performed with opened eyes, in which it is possible to observe that total length of the footpath in the group of women largely of parameters is higher in comparing to men. Similar results were obtained at the end of a specialist ski camp in parameters with OO. In examining with closed eyes was received the reverse . Men in comparing to women were characterized by maximum values the footpath in the attempt long by closed eyes. At the end of a ski camp consecutive measurements, from which it isn't possible explicitly to come to the conclusion .. were performed from which the examined group had higher parameters as regards OO. in examining with opened eyes, the majority of mean was higher in the group of men except for the average position of the y coordinate of a lever, the field of the ellipse and the length of the path. In the conducted examination at the end of a ski camp in the attempt with closed eyes the group of women was characterized by cheapnesses in the field of the ellipse of the 95% of confidences (where the 95% of data is in the range of this ellipse) and in the total length of the path. On the base of the own examinations were observed differences in the stability of the attitude of the body between students and students of the skiing training. It isn't possible explicitly to state, which examined group had better stability of the attitude. Selected parameters let notice that the group of women in the course of the training had maximum values of parameters particularly with OO attempt in comparing to the male group. Students in the course of lasting the camp with opened eyes were characterized by a shorter COP path and in the process showed the

better stability of the attitude in the comparison to female students. The opposite situation had place in examining with closed eyes. Men in the course of lasting the camp have maximum values in the comparison to the female group. In the test with closed eyes of the female student had minimum values of the length of the path and surface areas had ellipses, in the process it is possible to state the fact that women in examining with closed eyes have a postural better stability. To sum up, on the base of the research, men in the attempt with opened eyes have a better stability, however women are getting minimum values and in the process better stability with closed eyes.

Value of the COP scope in the coronal plane and fibular is showing the magnitude of deviation from the verticals in the both directions of movement. It is rate of the stability of the body dependent on transfers of the middle of the body weight which is causing the change of putting the point of the pressure of feet on base. Changes of the COP situation are secondary and always bigger in one's amplitude from transfers of the middle of the body weight. Lowering of value of the amplitude indicators means improving of the stability of bodies with reference to the baseline situation and inversely - increased values of these indicators are evidence of the degeneration of the stability of the body in the physics meaning [Sobera M., Characteristics of the process of keeping the balance of the body at children at the age of 2-7, Studies and Monographs No. 97, AWF Wrocław, Wrocław 2010, p. 67.]

On the base of the own examinations of authors of the work he notices that at the end of the training the group of women and men demonstrated the greater tendency to imbalance in the coronal plane both in the OO attempt as well as OZ. on this base it isn't possible to state improving or worsening of this parameter, because movements in the coronal plane are peculiar to the discipline of skiers. Through movements in these plains a turn is being initiated, in this case increased their amplitude can turn out straight out to be the desirable feature. Examinations of the author in these parameters are comparable with the clinical research of Curzynek and partners which established the dominance of COP transfers [Curzynek M., Mraz M., Mraz M., Rook W., Skolimowski T., Structural stability In patients with vertigo and disequilibrium of system origin,, Acta Bio-Optica ah Informatica Medica\ "4 / 2008, vol. 14, p. 290.]

Both clinical data, and numerous findings are indicating, that good physical fitness, active lifestyle, increasing mass and muscle power through physical exercises attitudes are supporting the better control [Ocetkiewicz T., Skalska A., Grodzicki T., 2005, Balance estimation in order to Rusing the computer balance of platforms: repeatability of the measurements,, Gerontology Poland\ ", volume 14, No. 1, p. 147.]

Authors of the work notice, that comparing results conducted in the course of training camp to results carried out at the end, the group of women demonstrated parameters largely lowering of value of indicators both in the OO attempt as well as OZ. Comparing the results achieved during and at the end of the skiing training in the male group, it is possible to notice , that the majority of parameters is characterized by an increase in number in the OO attempt and at OZ.

After the specialist ski training the body weight in the group of women and men rose. Increasing the body weight is probably associated with an increase in muscle mass. They reached similar conclusions in Kunysz examinations and Blachura who conducted the research on the body weight of snowboarders during the five day camp. In groups of snowboarders about the different degree of the progress an increase in the body weight was registered at the simultaneous fall in mass of fat [Kunysz P., Blachura B., 2008, Changes of BMI indicator and composition of the body of snowboarders in the end of five-day snowboard training,, Antropomotoryka\ ", No. 43.]

OVERALL CONCLUSIONS:

1. Findings are showing •, that among the group of women and the group of men, staying on the specialist ski training, important differences appeared in the stability of the attitude of the body. They observed that in the group of women shortening the COP track was providing conducts about improving the stability and in the process it is possible to notice that, the applied training program had an impact on the postural stability.
2. The visual inspection influences to the stability of the attitude of the body both in the female group considerably as well as in male. Students have minimum values in the total length of the path at OO and women are characterized by minimum values of the total length of the path with OZ. on the basis of the results it is possible to state that men have a better stability in examinations with opened eyes, however women in examinations with closed eyes.

The body weight of examined persons has changed. In the course of the training a lower body weight was characteristic for a group, in comparing to the body weight after the training. Increasing the body weight after the specialist ski training is associated with an increase in muscle mass.

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