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THE SOMATIC STRUCTURE AND THE LEVEL OF THE MOTOR ABILITIES OF MEN IN AN AGE: 35–39 AND 45–49 OF YEARS SERVING THE PUNISHMENT OF IMPRISONING AT POLISH UNITS

Дане дослідження було спрямоване на визначення відмінностей в соматичній будові та рівню розвитку рухових здібностей між ув'язненими чоловіками та особами, що проживають в на території Кракова і Нової Гуті. Всі обстежувані (59 осіб) були розділені на дві вікові групи: 35–39 і 45–49 років. Тестування проводилися у в'язницях, що знаходяться у відомстві Жешувської інспекції Пенітенціарної служби, а саме: в'язницях Медики, Ясло та Дебиці. Оцінювання здійснювали за вісьма соматичними ознаками (зріст, вагу тіла, росто-ваговий індекс, обхват грудної клітки в стані спокою, три шкірні складки: на животі, під лопаткою, в ділянці трьохголового м'язу плеча) і п'ятьма тестами фізичної підготовленості (вибухова сила, статична потужність, частота рухів, гнучкість, статична рівновага). Результати обстеження виявили вірогідно більшу кількість жирового компоненту тіла в ув'язнених чоловіків. Водночас ув'язнені особи виявили вірогідно нижчий рівень розвитку усіх досліджених фізичних якостей.

Ключові слова: соматичні ознаки, рухові здібності, ув'язнені чоловіки.

Данное исследование было направлено на определение различий в соматической строении и уровню развития двигательных способностей между заключенными мужчинами и лицами, проживающими в на территории Кракова и Новой Гуты. Все обследуемые (59 человек) были разделены на две возрастные группы: 35–39 и 45–49 лет. Тестирование проводилось в тюрьмах, находящихся в ведомстве Жешувской инспекции Пенитенциарной службы, а именно: тюрьмах медики Ясло и Дебича. Оценки осуществляли с восемью соматическими признаками (рост, вес тела, росто-весовой индекс, обхват грудной клетки в состоянии покоя, три кожные складки: на животе, под лопаткой, в области трехглавой мышцы плеча) и пятью тестами физической подготовленности (взрывная сила, статическая мощьность, частота движений, гибкость, статическое равновесие). Результаты обследования обнаружили достоверно большее количество жирового компонента тела у заключенных мужчин. В то же время заключенные лица обнаружили достоверно ниже уровень развития всех исследованных физических качеств.

Ключевые слова: соматические признаки, двигательные способности, заключенные мужчины.

At work they made an attempt at determining differences in the somatic structure and the level of motor abilities between men imprisoned but men inhabited in – Cracow of Nowy Huta district. Comparable populations were divided in two age groups: 35–39 and 45–49 of years old. Overall 59 persons imprisoned were examined. Examinations were carried out in years 2005 and 2006 at prisons being part of a Rzeszow Inspectorate of the Prison Service, that is: Medyka Prison, Jaslo Prison, Debica Prison. Eight somatic traits and five attempts of

the physical fitness were provided with analysis. Results of examinations show, that adiposis of the bodies measured with the thickness of the three skinfolds (subscapular, triceps and abdominal) it is definitely bigger at persons which were imprisoned. The dominance of separated men is also noticeable in the case of chest measurement and arm measurement. Persons imprisoned achieve poor results in all analysed motor abilities.

Keywords: somatic traits, motor effects, men imprisoned.

Introduction. Adaptation changes the man to the environment, steal both on the individual as well as population level [47]. Kinds of the editing of the organism depends on lasting for the time and the strength of the environmental stimulus [15, 16, 19, 30].

The biology of the human organism is a complex, stimulated by process with influence of different environmental factors, and the physical fitness is conditioned moreover by the kind and intensity of the motor activity and hygiene and the lifestyle [23, 35, 36].

Updating the information concerning the biological condition of inhabitants of different regions of Poland has his deep grounds [43] particularly in the aspect of social and social conditions they usually stay in which [4, 49].

Assessment of the somatic structure and the physical condition of men imprisoned encountered few scientific studies so far [8]. Researchers focused their interests so far above all on characteristics of a system of values of young people with education problems [18], dysfunction of the education process of these young people [21, 48], psychological consequences of homosexual behavior of separated men [9, 39].

Few studies mentioned issues of the physical fitness and the somatic structure of young people staying in young offenders' institutions [10]. Isolated scientific works discussed sports interests of persons imprisoned [44] and of influence of the physical activity on the process of the rehabilitation of maladjusted socially young people [28].

An attempt to answer the following questions is a purpose of this work:

1) Do the persons separated in Polish penal institutions in the period of age: 35–39 and 45–49 years old differ in the somatic structure and the level of motor abilities from populations not staying persons in the prison isolation?

2) Do the essential connections are stated between the current criminality but the somatic structure and the level of motor abilities of men imprisoned?

Material and method. A group of 59 imprisoning men serving their prison sentence (Prisons: Jaslo, Medyka, Debica) was provided with examination. Examined were divided in two age groups: 35–39 of years (32 persons) and 45–49 of years (27 persons).

On the basis of anthropometry measurements, which was made according to principles being in effect in the anthropometry [29], a somatic structure of separated men was analysed assessing 8 parameters, that is: the height and the body weight, BMI indicator, chest circumference, arm circumference, thickness of the three skinfolds (subscapular, triceps and abdominal).

The physical fitness was assessed by carrying out 5 attempts: standing broad jump (explosive power), hand grip [right hand] (static power), plate tapping (frequency of movements), flamingo balance test [an attempt modified compared with Eurofit Test] (static balance), sit and reach (suppleness).

Research findings were worked out statistically, calculating: the arithmetic mean, the standard deviation, the rate of the changeability.

In order to capture differences between group arithmetic means of examined persons were normalised on 0 and 1 of test group (of Cracow population).

Results. Table 1 shows arithmetic means with supplementing of somatic traits men deprived of independence and comparative group (Cracow population).

Table 1

Comparative characteristics of somatic build between the persons deprived of independence and Krakow population in an age brackets: 35–39 and 45–49 of years

Trait		Age brackets	Own examinations				Cracow population				D ** W-K	t°
			N	X	S	Vz	N	X	S	vz		
1	Body height (cm)	35–39	32	177.0	5,7	3,2	180	176.0	6.0	3.4	1.0	1.52
		45–49	27	175.4	4.7	2,7	268	172.9	6,1	3.5	2,5	2,72*
2	Body mass (kg)	35–39	32	80.3	9,9	12.3	180	80.1	12,9	16.1	0.2	0,13
		45–49	27	76,9	8,7	11.3	268	81,1	12.8	15.8	-4,2	2.48*
3	BMI Indicator	35–39	32	25.6	3,1	11.9	179	25.9	3.6	13.9	-0.3	0.46
		45–49	27	25.0	2,8	11.1	268	26.9	3,7	13,7	-1.9	3.52*
4	Chest circumference (cm) (in the rest)	35–39	32	100.8	11,8	11,7	180	96.0	7.8	8,1	4.8	2,31*
		45–49	27	100.8	3,9	3.8	268	98.2	7.0	7,1	2.6	3,51*
5	Arm circumference (cm) (in the rest)	35–39	32	33,8	5,3	15,7	180	30,8	2.8	9,1	3.0	3,15*
		45–49	27	34.5	3.1	9,1	268	31,3	2.8	8.9	3.2	5,28*
6	Subscapular skinfold (mm)	35–39	32	23.6	11,8	50,1	180	17,2	7,9	46.0	6.4	2.95*
		45–49	27	24.3	10,1	41,7	268	18.1	7,2	39.8	6,2	3.09*
7	Triceps skinfold (mm)	35–39	32	17.0	11,2	65.9	180	9.6	3,9	40.6	7.4	3,69*
		45–49	27	15.7	8,3	52.8	268	9,4	5,3	56.4	6,3	3.87*
8	Abdominal skinfold (mm)	35–39	32	25.6	13,8	53.7	180	19.7	9,2	46.7	5.9	2,33*
		45–49	27	23.4	9,5	40.7	268	21,2	9,0	42.4	2.2	1,15

*Substantial statistically difference at the level $\alpha > 0,05$

**D:W – own examinations; K –test group

In the case of the height and the body weight differences statistically essential among comparable populations, made a note for age bracket 45–49 year. Isolated persons distinguish greater value of three analysed skinfolds thickness as well as chest circumference and arm circumference

Disproportions between examined groups in the case of BMI indicator almost reach 0.6 s. A chest measurement assumes identical value of disproportion. The largest standardized differences between groups appear for triceps skinfold (almost 2,0 s) (fig. 1).

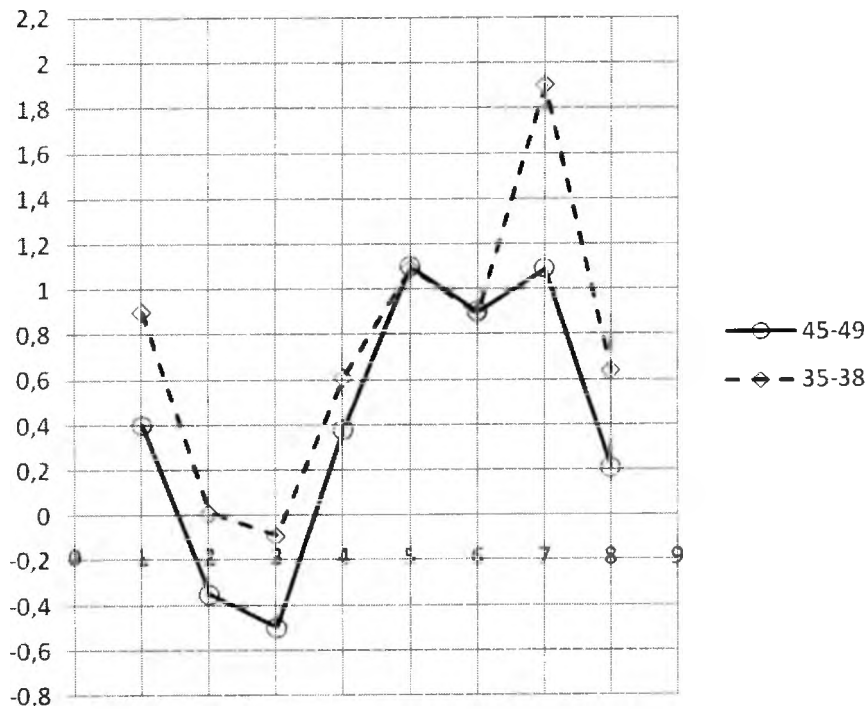


Fig. 1 Comparative characteristics of somatic build between the persons deprived of independence and Krakow population in an age brackets: 35–39 and 45–49 years (standardized results)
 * notations (numbering) of somatic trials like in table 1

Table 2 presents numerical characterizations of examined attempts of the physical fitness of persons serving the punishment of penitentiary secluding and of comparative material.

Table 2

Comparative characteristics of attempts of the physical fitness between the persons deprived of independence and Krakow population in an age brackets: 35–39 and 45–49 of years

Attempts	Age brackets	Own examinations				Cracow population				D ** W-K	t°
		N	X	s	Vz	N	X	S	Vz		
1 Standing broad jump (explosive power) [cm]	35–39	32	175.2	21,8	12.4	171	176.4	26.0	14.7	-1.2	0.15
	45–49	27	166.5	22,0	13.2	248	157.0	25.4	16.1	9.5	2,24*
2 land grip right hand] (static power) { N }	35–39	32	424.4	80.1	18.9	178	506.2	79.1	15.6	-81.8	5,73*
	45–49	27	399.6	72,0	18.0	258	476.0	84.0	17.6	-76.4	5,51*
3. Plate tapping *** (frequency of movements)	35–39	32	15,9	4.0	25.1	167	13.1	2.7	20.6	-2,8	3,90*
	45–49	27	17.5	4.7	27,0	245	13,7	3,3	24,1	3,8	4,19*
4 Sit and reach (suppleness) [cm]	35–39	32	45,0	5.6	12,4	176	54,7	8.4	15,3	-9,7	8,24*
	45–49	27	43,5	5,2	12,0	354	53.0	9.4	17,7	-9,5	8,43*
5 Flamingo balance test **** (static balance) [cm]	35–39	32	2.7	3,2	118.5	172	5,9	6.4	108,5	-3.2	5,66*
	45–49	27	3.6	2,2	61.1	253	5,5	2.6	47,2	-0.8	1.86*

*Substantial statistically difference at the level $\alpha > 0,05$
 **D: W – own examinations ; K – test group
 ***Result of the test is worse when absolute value is bigger
 ****Result of the test is better when absolute value is bigger

Behind the exception of age bracket 35–39 of years stated differences are statistically substantial on the level $\alpha > 0,05$ in the case of all analysed motor attempts. The biggest disproportions between groups were noted in group 35–39 of years in the case of the suppleness (almost 1.2 s), frequencies of movements at men from age bracket 45–49 of years, where standardized differences also achieve value almost 1,2 s as well as of static power (over 1,0 s) – group 40 – 44 of years (fig.2). In the more distant part of the work they made analysis of the somatic structure and the physical fitness of men imprisoned in the aspect of years spent in the penitentiary isolation. In order to carry it out the following groups were distinguished: 2,1 – 4 years, 4.1 – 6 years and above of imprisoning 6 years.

Table 3 presents averages to value of somatic traits considering staying years in the prison isolation.

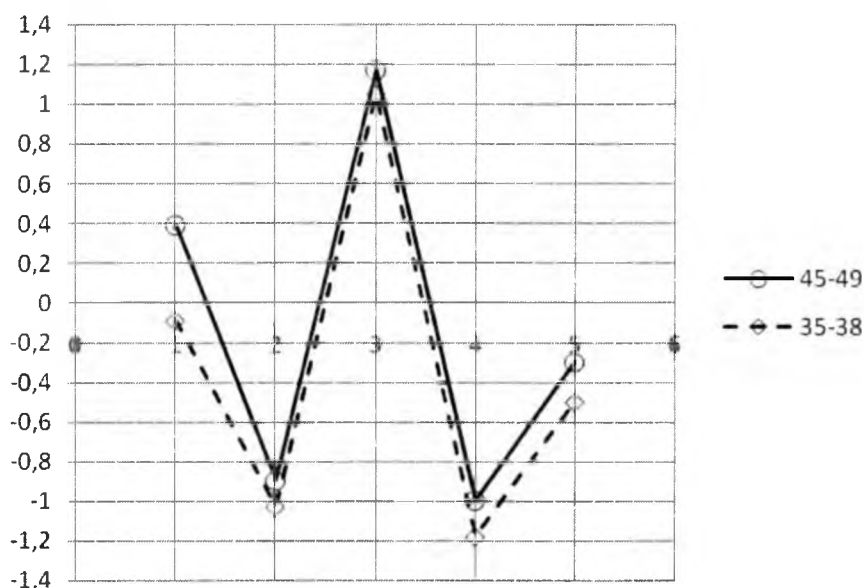


Fig. 1. Comparative characteristics of attempts of the physical fitness between the persons deprived of independence and Krakow population in an age brackets: 35–39 and 45–49 years (standardized results)

* notations (numbering) of attempts of the physical fitness like in table 2.

Table 3

Numerical characteristics of somatic traits persons deprived of independence in an age brackets: 35–39 and 45–49 of years in the aspect of years spent in penitentiary isolation

		Age average	Years spent in penitentiary isolation		
			2,1 – 4	4,1 – 6	over 6 years
Sum of cardinality		41,42	16	17	26
CHOSEN TRAIT OF THE SOMATIC STRUCTURE					
1	Body height (cm)	X	174,1	177,1	177,0
		s	4,6	5,6	5,5
		V	2,6	3,1	3,1
2	Body mass (kg)	X	77,5	78,3	79,0
		s	11,2	10,5	8,2
		V	14,4	13,4	10,3

3	BMI indicator	X	24,8	25,3	26,1
		s	3,0	3,4	2,6
		V	12,1	13,4	10,0
4	Chest circumference (cm (in the rest)	X	98,2	101,4	102,1
		s	15,4	6,7	4,4
		V	15,7	6,7	4,3
5	Arm circumference (cm) (in the rest)	3c	32,6	34,5	34,7
		s	4,2	5,9	3,3
		V	12,9	17,1	9,5
6	Subscapular skinfold (mm)	X	43,0	44,1	46,7
		s	12,4	16,7	18,1
		V	28,8	35,5	38,6
7	Triceps skinfold (mm)	X	33,7	32,6	35,0
		s	9,7	13,0	14,5
		V	28,9	39,8	41,3
8	Abdominal skinfold (mm)	X	42,1	43,6	46,0
		s	15,0	17,6	18,3
		V	35,6	40,3	39,8

Analysing arithmetic means of individual traits they state, that general growing over the years tendencies the isolation is stated for: body weight, BMI indicator, chest circumference, arm circumference and 2 skinfolds (subscapular and abdominal). The greatest diversity between groups they made a note for skinfold abdominal. The rate of the changeability for this somatic trait is bigger than 39%.

Table 4 depicts arithmetic means with supplements of chosen motor tests in groups according to the prison isolation.

Table 4

Numerical characteristics of attempts of the physical fitness persons deprived of independence in an age brackets: 35–39 and 45–49 of years in the aspect of years spent in penitentiary isolation

		Age average	Years spent in penitentiary' isolation		
			2,1 do 4	4,1 do 6	Over 6 years
Sum of cardinality		41,42	16	17	26
CHOSEN ATTEMPT OF THE PHYSICAL FITNESS					
1	Standing broad jump (explosive power) [cm]	X	173,4	171,4	166,5
		s	23,3	17,7	24,1
		V	13,4	10,3	14,5
2	Hand grip [right hand] (static power) {N}	X	432,0	405,3	400,5
		s	78,1	79,9	76,8
		V	18,1	19,8	19,2

3	Plate tapping * (frequency of movements) [cm]	X	17,2	15,6	13,8
		s	4,6	2,3	5,4
		V	26,8	14,8	39,1
4	Sit and reach (suppleness) (cm)	X	43,6	40,1	38,8
		s	3,6	6,3	6,0
		V	8,2	15,7	15,5
5	Flamingo balance test ** (static balance) (cm J)	.V	3,7	4,9	5,2
		s	4,1	1,5	2,6
		V	110,8	30,6	50,0

*Result of the test is worse when absolute value is bigger

** Result of the test is better when absolute value is bigger

The time of staying in the penitentiary seclusion has the negative influence to received results in the case of: explosive power, static power and the suppleness, however positive for the frequency of movements and static balance.

Discussion

Values of measuring features of the height diminish after 30 of year of the life, shows a tendency of reducing the value about 1 cm. on the decade [45, 46].

The comparative characterization the height of the body at examined populations points, that it has the individual course of the fall and it may confirm the thesis, it is strongly controlled genetically feature and isn't sensitive for environmental influences [12, 13,42, 49].

The body weight is considerably dependent on its height [33] what the confirmation is finding in this dissertation, where both somatic features among comparable populations aren't statistically substantial in an age bracket 35–39 of years. The growth of body weights of prisoners considering the time of staying in the penitentiary isolation has growing linear character and confirms current news reports, body weight is conditioned with influences environmental and cultural [5] and with lifestyle of the man [1, 14. 23,35].

The height of the body is an indicator of the advancement of the physical development and it doesn't determine in the explicit way the level of the motor development [7], which notable influence has the value of the BMI indicator which may attests about the contents of the fatty tissue [26].

BMI indicator of examined men examined in the context of years of the prison seclusion a growth tendency characterizes. A missing of systematic physical activity at persons imprisoned, which is also characteristic of the whole of the Polish society confirms the thesis, the dynamism of changes the indicator of the body weight is strikingly similar at people in all sorts populations, what may point at the role of the genetic factor and neurohormone steering [49].

The literature on the subject informs about appearing relations among obesity, and generally comprehended health [28]. The thickness of the three skinfolds (subscapular, triceps and abdominal) at population of separated man considerably exceeds values of arithmetic means made a note at the group being a frame of reference, and it may confirm good socio-economic conditions characteristic of Polish prisons, close relationship of the level obesity of organism with influences of environmental factors [6] and to prove low physical activity of persons imprisoned [8].

Concluding, the years spent in the penitentiary isolation have the influence on growth almost all analysed traits of the somatic structure of the men behind the exception of the body height and triceps skinfold. Distribution of the fatty tissue at men more is being determined with genetic factors than with factors of the environment and a lifestyle [40], and with the age

deepens typical of this sex central type of obesity with the characteristic accretion of the fatty tissue at abdominal area [6].

A residential surface on which separated men live [24], and therefore low in the twenty – four hour aspect anaerobic physical activity, orienting condemned persons for the selective attempts at physical exercises. So persons imprisoned prefer training in the support lying with front – this way called “press – ups” and pull upon the bar. Larger arithmetic means of chest measurements and the shoulder in the examined population may confirm the above thesis [Tbl. 1].

Strength of muscles flexors of fingers right hand of men representing the Cracow population much dominates over analogous arithmetical values of men imprisoned [Tbl.2]. In this regard, it is possible to find causes of this fact, in outside, undefined, about environmental factors, because static power characterizes low heritability poor genetic control [33], as well as faint slump in the life of men [22, 22] about 20% [46]. It was also confirmed, power of muscles of the hand increases to 45 of year of the life [33, 45, 46], what all the more could confirm the above assumption, having considered an age brackets accepted to the work of comparable populations.

A sequence of factors decides the motor effectiveness creating the optimal fitness structure, which coordinating abilities are of special importance in [20, 37, 38, 42], from the midst of which the balance for certain is of peculiar abilities [38].

Persons imprisoned in contrast with men representing the Cracow population a worse static balance is characteristic (shorter time of making the first mistake) [Tbl. 2], which actively is controlled by Central Nervous System [31]. It is possible to clarify such a state of affair with specificity of the place which stay separated persons in, as well as with it, as level of coordinating abilities is determined with complex of psychological properties [16, 26]. Depending on all sorts, outside factors (environmental), Central Nervous System through inside analysers anticipates minimal destabilizations of balance of the body and a stability keeps it [10].

A negative influence on the level of explosive power, static power and the suppleness has the period of the prison seclusion, and a cause of this fact it is possible to see it obviously sedentary lifestyle of men imprisoned. Pace of the slump of the physical fitness depends on the motor activity, and men systematically practicing characterizes not only a high of absolute locomotive abilities, but the pace of their fall is also smaller [22, 23].

Some researchers promote the thesis about the genetic homogeneity of the Polish population [2, 3, 4, 17]. However its problem seems to be arguable because it is hard to determine scope of the notion “region” with respect to comprehending the biotope or of ecological niche, which a lot exists in Poland [50, 51].

Disproportions between both examined groups for such motor abilities as: explosive power, static power, suppleness and the static balance may point at the attendance at Polish prisons strong stimuli modifying the living conditions, and through having it negative influence on the level of motor abilities of men separated from the society.

Conclusions

1. In the case of the height and the body weight differences statistically essential among comparable populations made a note for an age bracket: 45–49 of year.
2. Men imprisoned are characterized by much greater values of the thickness of three skinfolds (subscapular, triceps and abdominal).
3. The Cracow population achieves better results for everyone analysed attempts of the physical fitness.
4. With the passage of years of the penitentiary isolation increasing tendencies are discerned for: the body weight, the BMI indicator, the chest circumference, the arm circumference and two skinfolds (subscapular and abdominal).
5. A negative influence on the level of explosive power, static power and the suppleness has the period of the prison seclusion, however positive for: frequencies of movements and the static balance.

6. On the basis of get scores it is possible to suppose, as examined group of men imprisoned are a population, which in the notable way make impossible appropriate continuation of the development of motor abilities.

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