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THE TITLE: SOMATIC HEALTH AND PHYSICAL DEVELOPMENT OF YOUNG GIRLS OF DIFFERENT TYPOLOGICAL GROUPS.

Igor.HASIUK

Khmelnytskyi pedagogical university Khmelnitskiy institute of regional management and law.

The peculiarities of somatic health and physical development of girls aged 11-14 on the basis of their typological characteristics have been researched. Divergence of opinion in the assessment of the health state has been revealed.

The quantities of the morphofunctional indices and the tempo of puberty of young girls are connected with their belonging to the certain somatic type of physical structure

THE LEVEL OF PHYSICAL DEVELOPMENT AMONG GIRLS FROM RURAL REGIONS OF EASTERN POLAND IN RELATION TO THE LEVEL OF THEIR SEXUAL MATURATION

Helena POPJAWSKA, Agnieszka ZIENIEWICZ

Department of Human Biological Development Extramural Faculty of Physical Education

Human ontogenetic development consists of many phases and periods. Because of the complexity of the dynamics of developmental changes the period of maturation, when a child reaches sexual maturity, seems to be of the crucial interest. The essence of this period is characterized as a cycle of fast changes in physical, mental and social development.

The moment of the beginning of these changes, their rhythm and duration differ from individual to individual. Therefore, this period is characteristic of extreme differences between individual physical and biological development in the scope of population at the same calendar age (Milicer 1964, Volver, Viru 1997). That is why the objective of this work was to evaluate physical development of girls from rural areas at various stages of their sexual maturation.

Material and methods

The research was conducted in 1998-1999 at elementary and secondary schools of eastern Poland. It comprised 2678 rural children and teenagers, aged 7-19 included 1345 girls. The research was aimed at measuring basic somatic features and evaluation of the degree of sexual maturity among the said girls. Somatic measurements were collected based on Martin's technique (Martin, Saller 1957). Among others, the following were measured: height, body mass, thickness of skinfolds, in millimeters, measured on biceps and triceps muscles, below the scapular bone, on the abdomen, above the iliac spine and on the calf muscle. On the grounds of collected material and with the application of Slaughter's method (Slaughter et al. 1988). BMI was calculated, as well as, the level of fatty tissue in percentages. Sexual maturation among girls was evaluated on the grounds of Tanner's scale (1963). The girls under the research were qualified to appropriate age groups on the grounds of their calendar age, as suggested by International Biological Programme (1967). In the age groups selected in the above said way, number and percentage of girls at different degree of sexual maturation, as well as, average arithmetic means and standard deviations of analyzed somatic features were calculated. Significance of differences between somatic features of girls at differed stages of their sexual maturation was evaluated on the grounds of variation analysis (ANOVA).

Findings

While analyzing secondary sexual feature of the girls under the research the duration of I degree among some girls aged 14 was observed. But it should be noticed that starting from 10th year of life the number of those who had not started maturation yet was decreasing because the number of those with II, III, IV degrees was steadily growing (chart 1.)

Chart 1

Degrees of sexual maturation among girls from rural eastern regions of Poland

Age in years	Girls									
	Degrees of sexual maturation									
	I		II		III		IV		V	
	n	%	n	%	n	%	N	%	n	%
7	75	100,00								
8	95	100,00								
9	85	100,00								
10	80	83,33	12	12,50	3	3,13	1	1,04		
11	65	59,63	23	21,10	17	15,60	4	3,67		
12	21	19,09	34	30,91	43	39,09	10	9,09	2	1,82
13	5	4,46	15	13,39	40	35,71	34	30,36	18	16,07
14	1	0,86	6	5,17	18	15,52	48	41,38	43	37,07
15					2	2,20	23	25,27	66	72,53
16							22	18,18	99	81,82
17							4	3,28	118	96,72
18							2	1,87	105	98,13
19							2	1,89	104	98,11

The highest percentage of II degree development girls was at the age of 11-12, respectively 23,10% and 30,91 %, and showed the decreasing tendency to 5,17% at the age of 14. The duration of III degree is as short as the one of the II degree. It starts at the age of 10 and is completed at the age of 15. The highest value is characteristic for the girls at 12 - 39,09%. The IV degree continues for the longest period, it begins at the age of 10, in singular case it is still present at the age of 19. The percentage of girls in this stadium is the highest at the age of 13-14. The final V degree starts already among 12 year old. At the age of 19 almost all girls (98,11%) have already reached their sexual maturity.

Difference in somatic development which are present among peers at different stages of sexual maturation were analyzed. Two major age groups which are characteristic of almost all degrees of sexual maturation present were taken into consideration. They were 13-14 year old girls.

As subsequent phases of sexual development appear, the height of more advanced girls body increases. The difference were the bigger, the higher the disproportions in sexual development were. At the age of 13 the difference in the height between the girls at II and V stage was 6,14 cm, at the age of 14 it was 13,43 cm (Fig. 1)

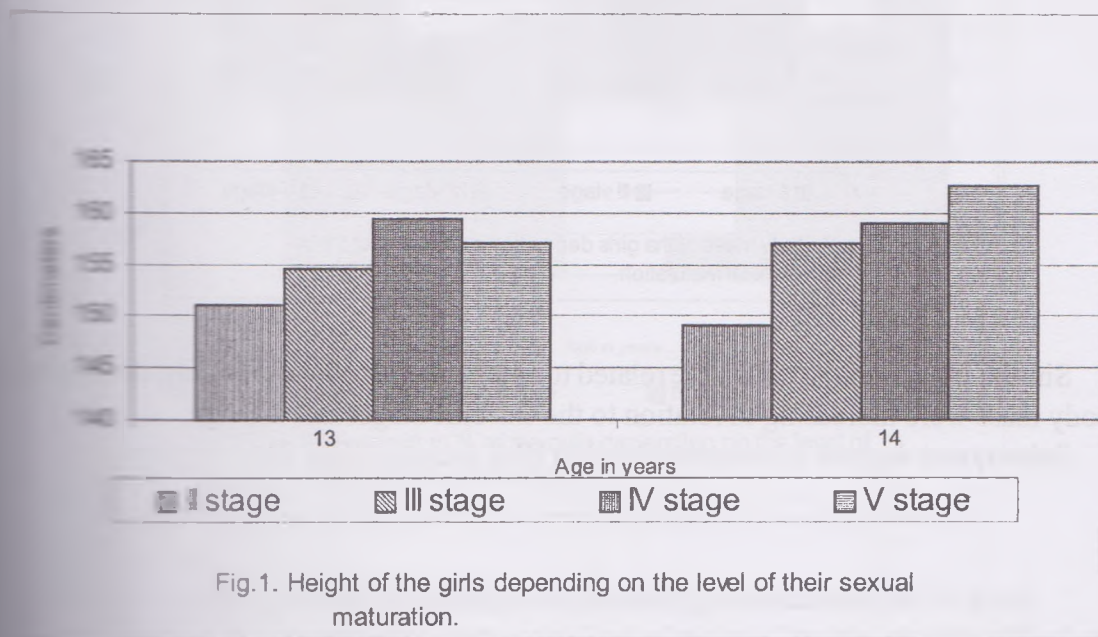


Fig. 1. Height of the girls depending on the level of their sexual maturation.

These difference were statistically relevant at the level of $p = 0,01$ (chart 2).

Chart 2.

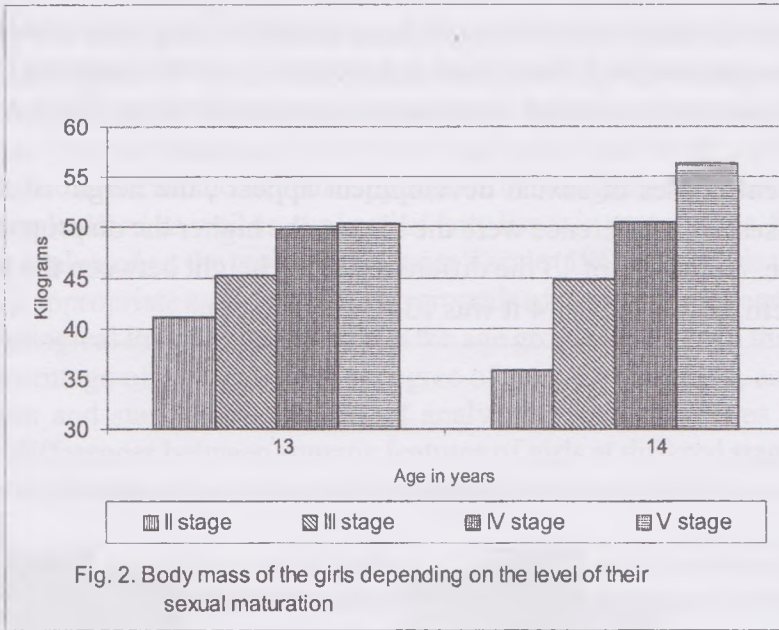
Results of variation analysis (ANOVA) between the somatic features and the degrees of sexual maturation of rural girls

Somatic features	Age in years			
	13		14	
	F	P	F	P
Height	7,599	0,001 ^{xx}	7,518	0,001 ^{xx}
Body mass	3,316	0,041 ^x	13,845	0,000 ^{xx}
BMC	1,706	0,187	8,873	0,003 ^{xx}
Body mass in %	0,308	0,736	4,481	0,013 ^x

x – differences statistically important at the level $p=0,05$

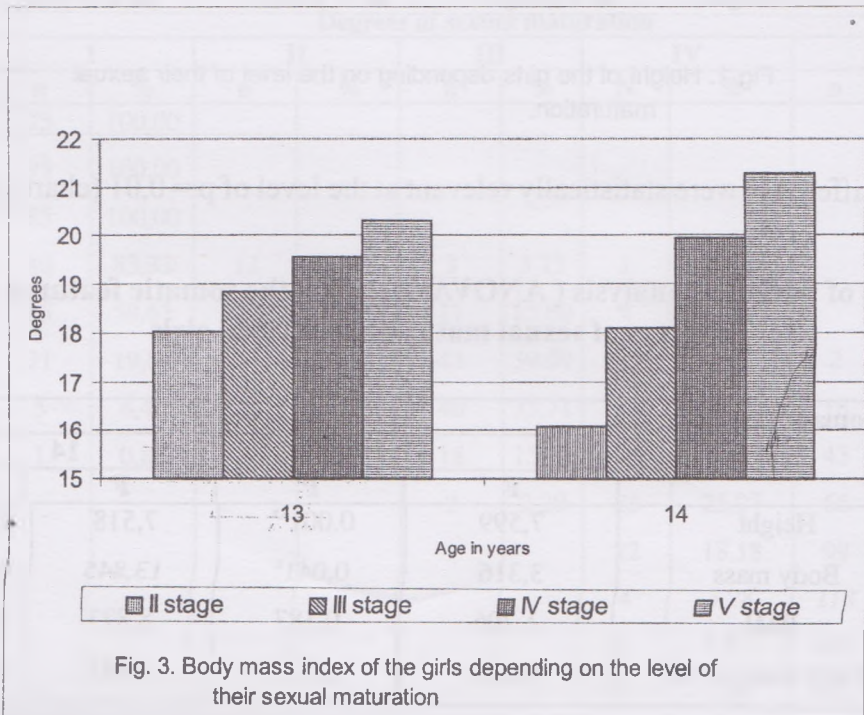
xx – differences statistically important at the level $p=0,01$

While analyzing body mass the highest average values of this feature relate to girls being the most advanced (V degree), and the lowest to those lagging behind (II degree). At the age of 13 the difference between these developmental groups equaled to 9,21 kg, at 14 – 20,50 kg (Fig. 2)



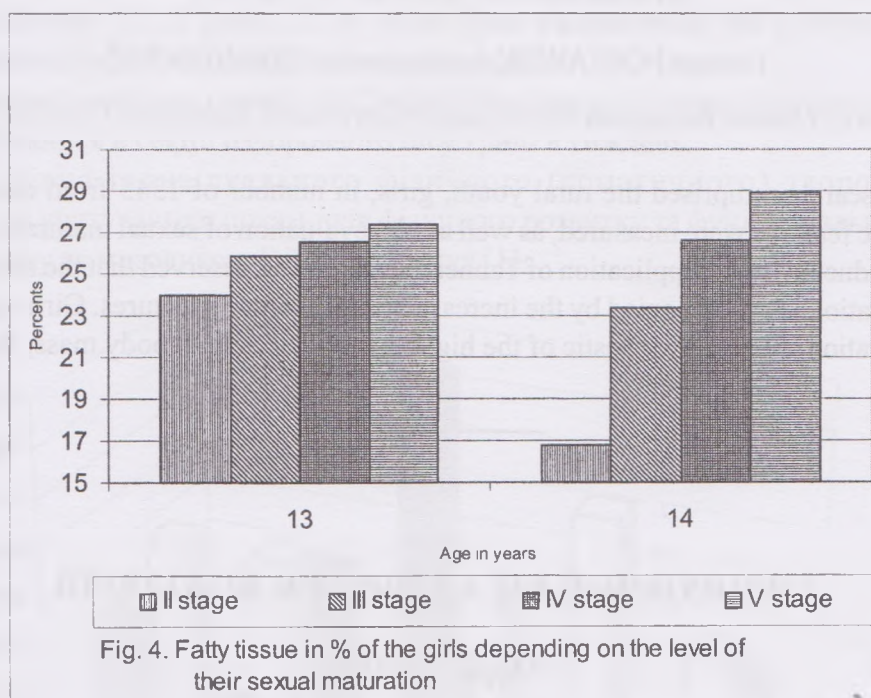
Similar phenomenon to the one related to height was observed. Namely, the differences in body mass were increasing in relation to the extreme stages and the age.

Subsequent degrees advancement led to BMI increase (Fig. 3)



At the age of 13 the difference of BMI between girls at II and V degrees was 2,34. The difference between II and III degree, and III and IV were lower and were respectively 0,80 degree and 0,70 degree. At the age of 14 greater disproportions were observed as related to the level of secondary features development. Similarly, as 13 year old, the highest difference can be accounted for II and V degree – 5,21 degree, next between III and IV – 1,33 degree.

In the case of a fatty tissue, its continuing growth was accompanied by advancement of maturation. At the age of 13 the difference between II and V degree was 3,51 %, between II and III was 1,97% and between III and V was 0,66%. At the age of 14 greater proportions in the level of the fatty tissue were noticed. Between II and III stages the difference was 6,66%, between III and IV – 3,29% and between IV- V it was 2,25 % (Fig.4)



Conclusions

On the grounds of the above findings the following conclusions can be made :

1. The advancement of sexual maturation is accompanied by the growth of the level of basic somatic features.
2. Girls at V degree of sexual maturation were characteristic of the highest values of height, body mass, BMI and fatty tissue in %.
3. The difference of the somatic feature values and extreme degrees of sexual maturation were the higher among 14 year old than among the 13 year old girls.

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Department of Human Biological Development Extramural Faculty of Physical Education

The research comprised the rural youth, girls, in number of 1345 from eastern Poland. Basic somatic features were measured, as well as, the evaluation of sexual maturation of the same girls was conducted by the application of Tanner's scale. It was observed that the advancement in sexual maturation is accompanied by the increase of basic somatic features. Girls at V degree of sexual maturation were characteristic of the highest levels of height, body mass, BMI and fat tissue in %.

ОЗДОРОВЧИЙ БІГ І ЗДОРОВ'Я ШКОЛЯРІВ

Марія ЧОПИК

Львівський державний інститут фізичної культури

Найдорожчим скарбом, яким нагороджує людину природа, є здоров'я. Це справді незрівнянне багатство, яке необхідно щоденно примножувати і надійно берегти.

На жаль в наш час, за даними різних фахівців, при вступі до школи різноманітне відхилення в стані здоров'я мають 25-30% дітей. За час навчання в школі серед 1,5 млн зростають нервово-психічні розлади, у 20-40% школярів спостерігаються порушення постави; 50-60% учнів схильні до частих захворювань. Кількість "абсолютно здорових" випускників шкіл за останні роки становить від 5 до 25% [2].

Однією з причин погіршення здоров'я школярів, поряд з іншими чинниками, є зниження обсягу рухової активності. Сучасний ритм життя збільшив навантаження на нервову систему, мозок, серце, судини і, водночас, скоротив роботу м'язів.

Проблему гіпокінезії у середовищі школярів посилюють збільшення кількості предметів навчального плану, створення класів із поглибленим вивченням окремих предметів, внаслідок чого кількість уроків сягає гранично допустимого навантаження. Через це діти змушені тривалий час сидіти за партою, а це в свою чергу веде до зменшення рухової активності.