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Characteristics of Physical Development and Psychological Adaptation in the Population of the Elementary School Age Children

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The relevance of the research topic

Health care of the children and adolescents is one of the most significant social objectives for the society as they comprise the reproductive and intellectual and social reserves for the state. In the recent years the situation with respect of the school age children's health is quite unfavorable. The number of absolutely healthy children has decreased (10-12%), 68% has functional disorders, 136.5% has physical development abnormalities and 17% have chronic diseases. In the structure of chronic diseases the shares of digestion organs (28.8%), locomotor (15.5%), nervous system (11.6%) diseases are the highest.

One of the objective integral health indicators of children's population is physical development. According to the data of numerous researches, 10.5% of the school children have body weight deficit, 83% - obesity, 1.7% impaired physical development, . Monitoring of anthropometric data of 22 thousand school children revealed high degree of acceleration and deceleration processes in various age groups.

Effective functioning of the child's organism systems ad organs determines not only the degree of physical development but also the adaptation ability of the child's organism.

The process of passing from the family environment to the education institution, i.e. to the qualitatively different one poses quite severe requirements to a child, including aggregate of mental, emotional and physical loads. According to the most recent studies, 60-76% of the elementary school age children have significant problems in adaptation to the school processes.

Numerous researches showed that the socioeconomic condition in the country, specific nature of demographic processes, general education level of the parents, biogenetic factors, climatic conditions, day regimen, dietary habits impacts the adolescents' health. Internal school risk factors, high workload, inadequacy of teaching methods with the students' capacities, non-compliance with the physiological and hygienic requirements to the education process are of no less significance.

In many regions of Georgia and in Adjara among them, there were observed the trends of health impairment of the school children and adolescents. According to the regional report on the Health and Social Condition of the Population of Autonomous Republic of Adjara, in 2014, 65522 cases of illness were recorded among children; incidence was high in the following classes of diseases: respiratory diseases (30496), infections and parasitic diseases (8836), diseases of digestion system (3129), and at the same time, hospitalization rate per 1000 children was 74.3 (Batumi, 2015). Regarding geographical-relief complexity in

Adjara Region, the population of high mountain villages still lacks services of medical specialists. In these conditions the main objective is observation over the health and physical development of the adolescents and forecasting, based on the available and information criteria.

The aim of clinical research

Study of the health, physical development and psychological adaptation characteristics in the elementary school children population (Adjara Region)

The methods of clinical research

Research was conducted in two phases. The first phase included single-stage screening in Batumi and village Tsikhisdziri. Health condition and physical development of 800 schoolchildren was studied. The examination was provided by the multidisciplinary team of physicians. For the purpose of accurate diagnostics the children were subjected to the additional laboratory and instrumental examinations. Surveyed population was categorized into four health groups. Group I included the children of normal physical and psychical development; group II: children with functional and morphofunctioal disorders; group III: children with chronic diseases at the clinical remission stage and group IV: children with chronic diseases.

For the second phase 480 school children of health groups I, II and III were selected as the focus population. Health status, chronic' structure diseases (according to the 10th Edition of International Classification of Diseases, 1995) and frequency, physical development indicators, degree of readiness for the school and adaptation, medical-biological and social-hygienic risk factors and their quantitative characteristics.

For the research process the following methods were applied:

1. Clinical-anamnesis survey: the questionnaire included demographic indicators, micro-social anamnesis, psychological climate in the family, information about perinatal period and hereditary load with somatic pathologies, past diseases etc. simultaneously the medical documentation was studied, parents, school physicians and teachers were interviewed. Study included standard lab tests (general blood test, general urine test, chemical panel, urine chemistry) and instrumental tests (ECG, ultrasonic study, x-ray as required).
2. Study of anthropometric characteristics with centile method

Anthropometric characteristics (body weight, height, chest and head circumference, body weight index) were studied by centile method, with due regard of the age and sex. In development of the centile tables, there was used no less than 100 centiles in the given age group. Body weight index (BWI) was measured by means of the formula: BWI=body weight (kg)/length (sq.m.)/ Degree of physical development was assessed by means of the two-dimensional centile scale: "body length – body weight".

3. Assessment of the readiness for the school and degree of school adaptation was provided by D. Stott's "observations map" and Luscher color test. Assessment of the adaptation potential was provided for the "observation map" scheme adapted for children completed with the participation of teachers and parents. Taking into consideration the children's age, 10 syndromes of 16 points in the "observation map" were selected.. Based on Luscher's color test the indicator of emotional self-esteem was determined and vegetation index according to Bishop's formula.

4. Study of risk factors by case control method

Retrospective case control study included 190 children of I, II and III groups. Social-hygienic, medical-biological risk factors, behavior disorders and school risk factors were studied. With respect of the risk factors, the opportunities ratio (OR) and attribute risk (AR) was determined for 95% confidence interval (CI).

Statistical analysis of the research results was provided with Microsoft Excel 2010 and SOSS/v12 software. For the anthropometric indicators the following statistical values were calculated: MEAN, MEDIANE, MODE, STDEV, minimal and maximal values.

Centile tables of anthropogenic characteristics was provided by non-parameter centile method, using Child Growth Percentile Calculator. Quantitative risk factors were determined using 2x2 table. To calculate reliability of difference between quantitative indicators of the compared groups Pearson criterion χ^2 was determined, with the relevant P value. Critical value of P reliability was <0.05.

The results of research

Complex study of the elementary school age children health showed that 28.3% of the studied population was actually healthy, 55% had morphofunctional disorders and 16.7% had chronic illnesses. Number of children with morphofunctional disorders and chronic illnesses was greater in the age of 6-7 years, compared with the children of 8-9 years age. Functional disorders were more frequent among the rural population while there were more cases of chronic diseases among urban population.

In the structure of chronic morbidity structure the share of digestion system pathologies was 15.8%, respiratory diseases – 10.0%; endocrine system – 9.2%; nervous system – 7.5%; locomotor system – 7.3%; ophthalmologic: 6.7%; blood circulation system – 5.4%. Share of digestion system (χ^2–9.771, p-0.002), blood and haematogenic (χ^2–5,960, P-0.015), nervous system (χ^2–6.794, P -0.012), ophthalmological (χ^2– 4.051, P –0.044) and locomotor system (χ^2–4.438, P-0.035) diseases was reliably higher among the children living in the cities. With respect of the other systems the chronic diseases were uniformly distributed.

Anthropometric data were measured in 800 children of the elementary school age. Body weight of the girls of 6-9 years age (23.2-34.8 kg) exceeded that of the boys (20.4-33.2 kg); similar trend was with respect of the body length as well: the girls (111.9-138.7 cm) were taller than the boys (109.7-135.0 cm), Head circumference was actually identical in both groups (51.5-54.8 cm in girls and 51.5-55.9 in boys), chest circumference in age of 6 was greater in girls while in 9 years' age it was higher in boys (girls – 56.4-67.8 cm; boys – 54.2-68.9 cm). Normal centile indicators of the girls' SMI were 18.5-19.1 and for the boys these indicators were 16.9-17.5. Indicators in the first centile corridor (girls – 14.7-14.6; boys – 15.0-15.4), data in the sixth centile corridor pointed to the excess weight (girls – 19.0-18.3, boys – 18.1-17.5) and data in the seventh centile corridor (girls - 18.7-18.8 and boys – 18.1-17.5).

Assessment of the physical development degree by the method of centile tables showed that 74.4% of the surveyed population had the normative indicators. Physical deviations upwards and downwards were identified in 139 children (17.4%) comprising so called "attention" i.e. observation group, requiring special medical attention and physical development monitoring. 63 children (7.9%) of very high indicators of physical development were included into so called "diagnostics group" for additional diagnostic studies and multidisciplinary consultations.

Assessment of the children's adaptation abilities by the D. Stott's "observations map" showed that 47.8% of the studied population had distrust to the unknown people; 23.6% had depressive mood; 27.8% - alarm in the presence of the grown-ups; 21.5% - enmity to the children and 20.4% - anxiety. Generally, disorders of adaptation to school were identified in 20-40% of children, mostly at the lower grades, both, at the personal level and to the surroundings.

According to the results of Luscher's color test most of the school children (90%) had normal emotional disposition to the education process, positive emotions, optimal studiousness and physical activity. 10% had

unpleasant feelings, negative disposition to the education process, impairment of energy reserves and physical activity.

Medical-biological, social-hygienic and internal school risk factors were studied by case control method. In the children with chronic diseases there was high frequency of the social factors: unsatisfactory life conditions (OR-1.558), low income in the family (OR-1.114), incomplete family (OR-1.011), instable climate in the family (OR-1.741) and the parent's harmful profession (OR-2.429). With respect of the family load with the somatic observations the dominating were thyroid pathologies (57.8%) and obesity (OR-2.094). Among the biological factors the significant ones included: mother's age over 30 at a time of child birth (OR-1.719), pregnancy pathologies (OR-1.245) and birth defects (OR-3.917).

In all cases of behavior disorders there were identified high relative and attribute risk rates: diet violations (OR-2.562, AR-0.22), excessive consumption of the food with high fat content (OR-2.625, AR-0.23), excessive consumption of the food with high hydrocarbon content (OR-2.321, AR-0.20), sleep violations (OR-2.545, AR-0.22), time over 3 hours spent with the computers, video games and TV (OR-2.655, AR-0.23).

Among the internal school risk factors, the dominating ones included: high volumes and difficulty of the homework (OR-1.673), problems of catering (OR-1.942) and heating (OR-2.103) problems, unsatisfactory hygienic conditions (comfortless desks, insufficient light etc.) (OR-1.509).

As a result of the performed research the characteristics of the chronic diseases and physical development in elementary school age children in Adjara Region were studied, the degree of adaptation to the school was assessed, priority risk factors were identified. Obtained data put on the agenda necessity of simultaneous implementation of measures of three inter-dependent directions: psychological, medical and pedagogical ones, this is significant for improvement of children's health, their adaptation to the school and effective preventive measures.

Conclusions

1. Complex study of the elementary school age children's health in Adjara Region showed that 28.3% were actually healthy, most of the children (75.7%) had health problems, among them, morphpfunctional disorders – 55% and chronic diseases – 16.7%.

2. Frequency of the functional disorders and chronic diseases was two times higher in age of 6-7 years, compared with the age of 8-9 years. 16.6% of the first health group children were from the urban and 11.7% - of rural areas. Functional disorders dominated in the rural population (29.2%) and the share of chronic diseases was higher in urban population (9.2%).

3. In the structure of morbidity the high share fall on digestion system (15.8%), respiratory (10%), endocrine (9.2%), nervous system (7.5%), locomotor (7.3%), ophthalmologic (6.7) and blood circulation (5.4%) diseases.

4. Share of the digestion system (P-0.002), blood and haematogenic organs (P-0.015), nervous system (P-0.012), ophthalmological (P-0.044) and locomotor (P-0.035) systems' diseases was reliably higher than among the urban population. With respect of the other systems, distribution of the chronic diseases was similar both, in urban and rural areas.

5. Normative indicators of physical development degree were identified in 74.7% (598 children) of the studied population. 139 children (17.4%) with the high and low indicators were included into so called "attention", i.e. observation group and 63 children (7.9%) were included into so called "diagnostics group", requiring special medical observation and additional diagnostic studies.

6. Normative data of the body weight of the girls from 6 to 9 (23.2-34.8 kg) exceeded those of the boys (20.4-33.2 kg), with respect of the body length as well: the girls (111.9-138.7 cm) were taller than the boys (109.7-135.0 cm). Head circumference was actually identical in both groups (51.5-54.8 cm in girls and 51.5-55.9 in boys), chest circumference in age of 6 was greater in girls while in 9 years' age it was higher in boys (girls – 56.4-67.8 cm; boys – 54.2-68.9 cm).

7. Assessment of the children's adaptation abilities by the D. Stott's "observations map" showed that disorders of adaptation to school were identified in 20-40% of children, mostly at the lower grades, both, at the personal level and to the surroundings; these included depressive mood, anxiety, neurotic symptoms and with respect of the surrounding people – distrust to the unknown people, alarm and enmity to the grown-ups and peers.

8. According to the results of Luscher's color test most of the school children (90%) had normal emotional disposition to the education process, positive emotions, optimal studiousness and physical activity. 10% had negative emotional disposition to the education process, impairment of energy reserves and physical activity.

9. Risk factors impacting school children health included: low income in the family (OR-1.114), incomplete family (OR-1.011), conflict situations in the family (OR-1.741) unsatisfactory living

conditions (OR-1.558) and the parent's harmful profession (OR-2.429). With respect of the family load with the somatic observations the dominating were thyroid pathologies (57.8%) and obesity (OR-2.094). Among the biological factors the significant ones included: mother's age over 30 at a time of child birth (OR-1.719), pregnancy pathologies (OR-1.245) and birth defects (OR-3.917).

10. Share of the behavior disorders was identified: diet violations (OR-2.562, AR-0.22), excessive consumption of the food with high fat content (OR-2.625, AR-0.23), excessive consumption of the food with high hydrocarbon content (OR-2.321, AR-0.20), sleep violations (OR-2.545, AR-0.22) and low physical activity (OR-3.857).