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INDICATORS OF QUALITY OF LIFE IN SCHOOLCHILDREN WITH ABDOMINAL PAIN IN THE ASSESSMENT OF CHILDREN AND THEIR PARENTS IN ETHNIC POPULATIONS OF TYVA

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Aim. To study and compare indicators of quality of life in schoolchildren with abdominal pain in the assessment of children and their parents in the ethnic populations of the Republic of Tyva.

Material and Methods. In the Republic of Tyva, schoolchildren aged 7-18 years of the indigenous population (312 Mongoloids - Tuvans) and alien population (136 Caucasians) were examined using a cross-sectional method. Gastroenterological complaints and demographic information were recorded. To assess the quality of life of children, adapted Russian parent (CHQ-PF28) and child (CHQ-PF45) versions of the Child Health Questionnaire (CHQ) were used. The questionnaire allows you to assess various areas of a child's life. The studies were approved by the ethics committee and the consent of the patients (their parents) was obtained.

Results. A decrease in the quality of life was established in schoolchildren of both ethnic populations in the presence of abdominal pain, both in their own assessment and by their parents. This applies to the general state of health, and specifically to the state of physical, mental health, as well as the emotional sphere. At the same time, in the Tuvan population, when schoolchildren assessed their quality of life, in contrast to their parents, a decrease was noted on scales related specifically to indicators of mental and physical health. It is noteworthy that the decrease in quality of life indicators in the assessment of children is more significant than in the assessment of parents, and affects a wide range of questionnaire scales in both ethnic populations of schoolchildren in Tyva. At the same time, children with abdominal pain are severely limited in communication with peers, both due to emotional and physical problems, and often experience a constant feeling of anxiety and depression. The latter is not properly reflected in the results of the analysis of parental quality of life questionnaires.

Conclusion. The peculiarities of the frequency of family deprivation in ethnic populations have been established.

Keywords: quality of life, CHQ, abdominal pain, children, ethnicity, Tyva.

Abdominal pain is an acute problem in pediatric practice due to its widespread prevalence, reaching 13.5% [10]. In childhood, abdominal pain dominates, having different localization and mostly related to various nosological forms of functional pathology of the gastrointestinal tract: functional abdominal pain syndrome, functional dyspepsia (FD), irritable bowel syndrome (IBS), etc. [10, 14, 15].

There is convincing evidence linking the appearance of abdominal pain with various causes, which characterizes the multifactorial nature of their formation. Factors with the most pronounced negative impact on the development of abdominal pain in children include psychotraumatic factors, psychological disorders, errors in diet, etc. [10, 14, 16]. Often, abdominal pain present in childhood transforms into chronic pain. This circumstance dictates special attention to the problem [10].

In turn, abdominal pain is a factor with a pronounced negative impact on the quality of life of children. Quality of life is a multidimensional reflection of both physical and mental health and social functioning of an individual [6, 10]. At the same time, in children with abdominal pain, a decrease in the quality of life can be caused by both an immediate health problem and psychosocial distress, in relation to which the pain syndrome is secondary. A recent meta-analysis highlighted another problem that exists in children with chronic abdominal pain, which is interpreted as pain catastrophizing [10]. This condition is particularly closely associated with a decrease in the child's quality of life. At the same time, it is characterized by prediction and expect-

tation of something bad, and a feeling of helplessness [5, 6]. What matters is the level of stress resistance, determined by the physiological characteristics of the body's regulatory processes with a genetic basis. This affects both the prevalence of abdominal pain in children and their catastrophizing.

However, each disease can cause unique and individual-specific problems. Many researchers agree that monitoring the quality of life in pediatric practice is not only capable of verifying the effectiveness of preventive, therapeutic and rehabilitation programs, but also makes it possible to develop sound recommendations for improving the system of providing medical and social care to children [12, 17].

Aim. To study and compare indicators of quality of life in schoolchildren with abdominal pain as assessed by children and their parents in the ethnic populations of the Republic of Tyva.

Materials and methods. Schoolchildren in the populations of the indigenous and alien populations of the Republic of Tyva (Mongoloids - Tuvinsians and Caucasians) were simultaneously examined using a cross-sectional method. The age of the children ranged from 7 to 18 years. A total of 448 children were examined:

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indigenous population (Mongoloids - Tuvars) - 312 schoolchildren (7-11 years old - 187 and 12-17 years old - 125 people; boys - 127, girls - 185 people); alien population (Caucasians) - 136 schoolchildren (7-11 years old - 58 and 12-17 years old - 78 people; boys - 62, girls - 74 people). Standard questionnaires were filled out, recording gastroenterological complaints in the child and demographic information: age, gender, ethnicity.

The criteria for excluding children from the study were the presence of acute inflammatory diseases during the last month; chronic diseases in the acute stage; functional failure of organs and systems of the body; mental, intellectual disabilities and language barriers among the subjects.

To study and interpret the quality of life and health status of children, adapted Russian parental (CHQ-PF28) and child (CHQ-PF45) versions of the Child Health Questionnaire (CHQ) [7, 8], which is an instrument approved by the International Center for the Study of Quality of Life, were used and is recommended for use in scientific research to assess the quality of life of children [3]. Using the questionnaire, you can assess various areas of a child's life. These are "General health assessment", "Physical activity", "The role of emotional and behavioral problems in disability", "The role of physical problems in disability", "Pain/Discomfort", "Behavior", "Mental health", "Self-assessment", "Changes in health", "Emotional impact on parents", "Limitation of parents' free time", "Family activity", "Family cohesion". Quality of life indicators were calculated using a 100-point system. A decrease in score indicators is associated with a lower level of the child's quality of life. The study was conducted after the parents signed the informed consent. The research work was approved by the ethics committee and carried out within the framework of the state scientific theme of the Federal State Budgetary Institution Federal Research Center KSC SB RAS ("Research Institute of Medical Problems of the North").

To carry out statistical analysis of the study data, SPSS (version 23.0; IBM, Inc.) and Microsoft Excel 2010 were used. Quantitative data were described using the arithmetic mean (M) and standard deviation (SD). The significance of differences in traits was analyzed using Mann-Whitney tests for independent samples and Wilcoxon signed rank tests for related samples. Statistical significance of differences in characteristics was assessed at $p < 0.05$.

Research results and discussion.

In parent assessments using the CHQ questionnaire, quality of life scores for Caucasian schoolchildren with abdominal pain were reduced compared to children without complaints (Table 1). Specifically, a decrease in indicators on the "General health assessment" scale ($p = 0.001$) and on the "Pain/Discomfort" scale ($p = 0.001$) was established. This indicates that the presence of severe or frequent abdominal pain is a factor that causes significant concern for parents. In addition, in children with abdominal pain, according to the parent questionnaire, there was a decrease in indicators on the "Behavior" scale, consisting of immature, sometimes aggressive behavior of the child ($p = 0.008$); on the "Mental health" scale, as well as on the "Family cohesion" scale ($p = 0.003$), which indi-

cates a lack of ability in the family to get along with each other and negotiate.

At the same time, in the assessment of schoolchildren themselves with abdominal pain in the Caucasian population, more significant negative deviations in indicators on the scales of the CHQ quality of life questionnaire for children were noted, relative to children without complaints. This concerned such scales as "General health assessment" ($p = 0.001$), "Pain/Discomfort" ($p = 0.001$), "Behavior" ($p = 0.001$), "Mental health" ($p = 0.001$) and "Family cohesion" ($p = 0.086$), according to which, in their assessment, like their parents, there was a decrease in indicators. But, in addition, in children with pain, when assessing the quality of life, lower scores were obtained than in children without complaints on such a scale as "Family activi-

Table 1

Indicators of quality of life in schoolchildren with abdominal pain in the Caucasian population of Tyva as assessed by children and their parents using the scales of the Child Health Questionnaire

CHQ version	CHQ scales	With abdominal pain (n=66)		Without abdominal pain (n=70)		P
		M	SD	M	SD	
Parent version	1. General health assessment	44.3	17.4	60.7	22.8	0.001
	2. Physical activity	91.1	19.0	93.9	16.0	0.371
	3. Role of emotional problems in limited life activity	81.5	27.3	87.7	23.3	0.166
	4. Role of physical problems in limited life activity	87.1	25.3	90.7	21.4	0.401
	5. Pain/Discomfort	60.6	18.6	79.3	14.8	0.001
	6. Behavior	61.3	16.4	69.3	13.5	0.008
	7. Mental health	78.5	26.3	87.0	22.5	0.029
	8. Overall comprehension of health	56.2	24.9	57.3	22.7	0.970
	9. Changes in health condition	61.7	23.7	62.3	19.9	0.819
	10. Emotional influence on parents	43.4	32.0	51.3	30.8	0.144
	11. Free time limitation	82.5	25.5	81.6	27.6	0.838
	12. Family cohesion	76.4	18.4	85.2	20.2	0.003
Children's version	13. General health assessment	48.1	21.6	64.3	25.0	0.001
	14. Physical activity	89.7	19.0	91.8	16.7	0.318
	15. Role of emotional problems in limited life activity	71.9	25.6	78.6	20.5	0.177
	16. Role of physical problems in limited life activity	79.7	28.0	85.1	26.1	0.224
	17. Pain/Discomfort	58.3	23.8	77.5	19.6	0.001
	18. Behavior	66.8	11.8	74.2	9.3	0.001
	19. Mental health	66.9	14.9	75.0	11.3	0.001
	20. Self-assessment	73.1	20.5	78.3	19.0	0.119
	21. Overall comprehension of health	65.6	24.3	73.5	19.5	0.087
	22. Changes in health condition	60.8	23.0	63.8	20.8	0.391
	23. Family events	69.7	16.4	77.3	20.2	0.008
	24. Family cohesion	78.5	20.8	84.3	19.4	0.086
P1-13		0.085		0.200		
P2-14		0.302		0.171		
P3-15		0.010		0.013		
P4-16		0.022		0.059		
P5-17		0.363		0.330		
P6-18		0.006		0.002		
P7-19		0.001		0.001		
P8-21		0.023		0.001		
P9-22		0.648		0.378		
P12-24		0.572		0.527		

Table 2

Indicators of quality of life in schoolchildren with abdominal pain in the Tuvan population of Tyva as assessed by children and their parents using the scales of the Child Health Questionnaire

CHQ version	CHQ scales	With abdominal pain (n=181)		Without abdominal pain (n=131)		P
		M	SD	M	SD	
Parent version	1. General health assessment	49.3	20.3	64.7	23.0	0.001
	2. Physical activity	86.1	25.6	92.6	19.5	0.001
	3. Role of emotional problems in limited life activity	84.6	23.7	84.8	23.1	0.991
	4. Role of physical problems in limited life activity	89.6	21.0	89.5	21.4	0.978
	5. Pain/Discomfort	67.5	20.3	80.6	17.4	0.001
	6. Behavior	71.6	15.8	76.1	15.3	0.019
	7. Mental health	92.0	16.2	89.7	21.1	0.982
	8. Overall comprehension of health	52.6	26.7	58.8	25.7	0.054
	9. Changes in health condition	62.1	24.5	73.4	24.0	0.001
	10. Emotional influence on parents	47.4	30.5	48.0	33.9	0.807
	11. Free time limitation	75.7	31.3	77.8	30.2	0.487
	12. Family cohesion	78.2	18.2	83.9	17.2	0.008
Children's version	13. General health assessment	52.1	20.6	63.9	24.6	0.001
	14. Physical activity	83.5	25.4	89.8	21.2	0.004
	15. Role of emotional problems in limited life activity	79.4	23.0	84.5	20.6	0.047
	16. Role of physical problems in limited life activity	76.9	30.7	86.0	27.6	0.004
	17. Pain/Discomfort	66.9	22.7	80.9	20.0	0.001
	18. Behavior	71.9	12.2	76.9	10.5	0.001
	19. Mental health	70.6	13.5	74.3	14.1	0.021
	20. Self-assessment	80.4	20.2	84.9	17.7	0.062
	21. Overall comprehension of health	62.3	19.7	66.1	22.7	0.114
	22. Changes in health condition	61.9	23.5	72.8	23.7	0.001
	23. Family events	70.6	21.0	81.6	20.1	0.001
	24. Family cohesion	77.0	20.2	83.7	20.5	0.002
P1-13		0.053		0.899		
P2-14		0.084		0.014		
P3-15		0.053		0.926		
P4-16		0.001		0.083		
P5-17		0.787		0.826		
P6-18		0.681		0.704		
P7-19		0.001		0.001		
P8-21		0.001		0.055		
P9-22		0.943		0.862		
P12-24		0.504		0.901		

ty" ($p = 0.008$). It should also be emphasized that children with abdominal pain additionally had a pronounced tendency to decrease on the "General perception of health" scale ($p = 0.087$).

When comparing indicators on the scales of parental CHQ questionnaires, lower indicators were obtained than in the assessment of the children themselves on the "General perception of health" scale ($p = 0.023$). In addition, parents more often paid attention to the immature, sometimes aggressive behavior of their children, as evidenced by lower scores on the "Behavior" scale ($p = 0.006$). Then, in assessing the quality of life of children with abdominal pain themselves, unlike parents, there was a decrease in indicators on the scales "Role of physical problems in limiting life activity" ($p = 0.022$), "Role of emotional problems in limiting life activity" ($p = 0.01$) and "Mental health" ($p=0.001$). All this indicates that children have problems communicating with peers, which is reflected in their behavior and is accompanied by aggression and immature, sometimes criminal behavior.

In the Tuvan population, in the assessment of parents of the quality of life of schoolchildren with abdominal pain, deviations are observed mainly on similar scales as in the Caucasian population (Table 2). This concerned the following scales: "General health assessment" ($p=0.001$), "Pain/Discomfort" ($p=0.001$), "Behavior" ($p=0.019$), "Family cohesion" ($p=0.008$). Additionally, in the assessment by parents of the quality of life of their children in the Tuvan population, in contrast to the Caucasian population, a decrease was noted on the scales "Physical activity" ($p = 0.001$), "General perception of health" ($p = 0.054$) and "Changes in health status" ($p=0.001$).

At the same time, in the Tuvan population, in the assessment of schoolchildren themselves with abdominal pain, a more significant decrease in their quality of life was noted. On almost all scales of the children's CHQ questionnaire, they had a decrease in scores compared to children without abdominal pain. The decrease in indicators affected almost all scales. These scales are: "General assessment of health" ($p=0.001$), "Physical activity" ($p=0.004$), "The role of emotional problems in limiting life activity" ($p=0.047$), "The role of physical problems in limiting life activity" ($p=0.004$), "Pain/Discomfort" ($p=0.001$), "Behavior" ($p=0.001$), "Mental health" ($p=0.021$), "Changes in health status" ($p=0.001$), "Family activity" ($p = 0.001$), "Family cohesion" ($p=0.002$). In addition, they showed a tendency

to decrease on the "Self-assessment" scale ($p = 0.062$).

At the same time, in the assessment of parents, in comparison with the assessment of schoolchildren, in the Tuvan population, a decrease in indicators was noted on scales that affect only general issues of children's health. These are the scales "General assessment of health" ($p=0.053$) and "General perception of health" ($p=0.001$). Whereas in the population, when schoolchildren assessed their quality of life, unlike parents, a decrease was noted on scales related specifically to indicators of mental and physical health. These are the scales "The role of emotional problems in limiting life activity" ($p = 0.053$), "The role of phys-

ical problems in limiting life activity" ($p = 0.001$), "Mental health" ($p = 0.001$). All this indicates that children with abdominal pain are severely limited in communication with peers, both due to emotional and physical problems. At the same time, children often experience constant feelings of anxiety and depression.

Thus, in the Republic of Tyva, schoolchildren with abdominal pain syndrome, both in their own assessment and by their parents, experience a decrease in quality of life. Studying the latter makes it possible to analyze comprehensive aspects of a child's life. The results indicate that a decrease in the quality of life in children with complaints of abdominal pain also concerns the general state of

health, specifically the state of physical, mental health, as well as the emotional sphere. It has been established that they have significant limitations in communicating with peers, both due to emotional and physical problems. It is noteworthy that the decrease in quality of life indicators in the assessment of children is more significant than in the assessment of parents, and affects a wider range of scales of the CHQ questionnaire in both ethnic populations of schoolchildren in Tyva. At the same time, children with abdominal pain often experienced constant feelings of anxiety and depression. The latter is not properly reflected in the results of the analysis of parental quality of life questionnaires. This probably indicates a lack of proper attention to the child's problems or the presence of a negative psycho-emotional climate in the family. This factor can act as a trigger for abdominal pain in a child, resulting from psychosocial distress, which has been found to be closely associated with functional disorders in the body [5, 6]. Thus, in the overwhelming majority of cases, abdominal pain syndrome among schoolchildren in Tyva is caused by functional disorders [1]. Moreover, under the guise of abdominal pain, they often have psychosomatic diseases (up to 65.0%), which require consultation with a psychologist and psychiatrist [5]. It has also been established that psychosocial distress is more closely associated with a decrease in quality of life than physical (organic) health problems [6].

Abdominal pain in children is often prospectively associated with its catastrophization (somatization) and is associated with the occurrence of psycho-emotional abnormalities. In this situation, children experience increased suspiciousness, a sense of defenselessness, anxiety, and depression [6, 12, 13]. In this regard, another problem emerges for the children of Tuva. This problem is depressive states, which in the Republic is characterized by particular severity due to the most negative indicators of child suicide in the Russian Federation [4].

At the same time, it was found that in the Tuvan population, estimated indicators of quality of life in schoolchildren with abdominal pain affect a larger number of scales, on which there is a decrease in indicators. To a certain extent, this can be ensured by the participation of genetic influence (functional characteristics of the digestive organs, nervous system - forming the level of stress resistance, the level of adaptation to environmental living conditions) [10, 11]. Thus,

indigenous adolescents of the northern regions have peculiarities of the emotional sphere, consisting in a tendency to despondency, increased suspiciousness and a feeling of insecurity [4].

A large role in the occurrence of functional disorders in the body is given to the psychological climate in the family. In ethnic populations there may be a unique influence of factors that shape the psychological climate in the family. These are the education of parents, the quantitative composition of the family, the sanitary and hygienic standard of living of the family, the specifics of relationships and behavioral reactions in the family, dietary habits, etc., which are largely related to the ethnocultural characteristics of populations [2, 9]. All this, undoubtedly, is reflected in the level of resistance to various types of stress.

Comparison of quality of life indicators based on the assessment of the children themselves and their parents, in our opinion, is an informative tool for identifying psychological problems in schoolchildren with abdominal pain, which will reveal the presence of intra-family problems in the child and his "Family deprivation". The latter, namely the lack of proper contact between the child and the parent, is emphasized by the fact that in both populations, in assessing the quality of life by both the parents and the children themselves with abdominal pain, there was a decrease in values on the "Family cohesion" scale. The results of the study, in addition, indicate that children with abdominal pain are severely limited in communication with peers, both due to emotional and physical problems. This circumstance, obviously, can intensify their constant feelings of anxiety and depression. In this case, the child is left alone with his problems.

There is a point of view about the high effectiveness of using integrative assessments of quality of life in the analysis of treatment results, the course and prognosis of specific pathological conditions [17]. It seems that a comparative assessment of quality of life indicators using the scales of the CHQ questionnaire allows us to obtain data on the psychological and communicative relationships of family members. This, in turn, makes it possible for the majority to understand the cause of chronic abdominal pain. In addition, it allows us to develop a strategy and tactics for managing such patients by eliminating or mitigating the influence of negative intrafamily factors. It is necessary to more often involve psychologists and psychiatrists in the treatment of children with abdominal pain syndrome

to isolate the contribution of psychosocial distress and the somatic component in the occurrence of complaints.

Conclusion. Thus, among Tyva schoolchildren, the presence of abdominal pain syndrome is associated with a decrease in the quality of life, both as assessed by the children themselves and their parents. Lower quality of life indicators were determined by the assessment of children themselves, especially indigenous schoolchildren, which affect almost all scales of the CHQ questionnaire. Tuvans have extremely pronounced differences in quality of life indicators when assessed by parents and children. At the same time, Tuvans with abdominal pain experience depressive symptoms, which are often disguised as behavioral disorders of the child.

Assessment of quality of life is an informative tool in assessing both the somatic and mental components in the formation of abdominal pain and can be recommended for wider use in practice.

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IN-VITRO EVALUATION OF THE ANTIOXIDANT ACTIVITY OF AQUEOUS AND ETHANOL EXTRACTS OF *VACCINIUM VITIS-IDAEAE* L. LEAVES

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Biologically active substances in lingonberry leaves (*Vaccinium vitis-idaea* L.) have antioxidant properties. This study selected the optimal extraction method to obtain extracts with a high content of biologically active components with antioxidant activity from the leaves of *Vaccinium vitis-idaea* growing in Yakutia. The data obtained allow us to conclude that biologically active substances isolated by alcoholic extraction from the leaves of *Vaccinium vitis-idaea* can be used in medicine to find approaches to regulating pro-oxidant processes in the human body under various pathological conditions.

Keywords: lingonberry, biologically active substances, gravimetric method, model system.

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Introduction. For the treatment and prevention of new viral diseases, there is a need to search for new drugs. Plant-origin preparations with a high content of biologically active substances (BAS) are highly interesting due to their safety, availability, and renewal of biological resources. The quantitative and qualitative content of BAS of plant raw materials depends on natural conditions [6]. For example, the accumulation of BAS by plants can be influenced by the following factors: growing region conditions, cultivation method, weather conditions, maturation stages, soil, and extraction method [4, 5]. Thus, the harsh and unique abiotic factors of the plant growing environment in Yakutia contribute to the active accumulation of biologically active compounds in plants during a relatively short growing season.

In pharmaceutical practice, the most interesting are medicinal plants con-

taining phenolic compounds with pronounced antioxidant properties.

Common lingonberry (*Vaccinium vitis-idaea* L.) is a perennial shrub belonging to the Heather family (Ericaceae). *Vaccinium vitis-idaea* grows in coniferous and mixed forests, in the mountain and plain tundras, and sometimes on peat bogs. The entire aboveground part of *Vaccinium vitis-idaea* is used as a medicinal raw material: shoots, leaves, and berries. In 2018, common chasteberry was included in the State Pharmacopoeia of the Russian Federation (XIV edition). In medicine, the leaves of *Vaccinium vitis-idaea* are used as a diuretic, antimicrobial, and anti-inflammatory agent.

According to literature data, components of *Vaccinium vitis-idaea* exhibit anti-inflammatory, neuroprotective, hypoglycemic, antioxidant, and antitumor properties, which are determined by the