

Psychological characteristics of adolescents with diseases of the endocrine system

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ABSTRACT

This article discusses the psychological characteristics of adolescents with endocrine system diseases, the functions of the endocrine system, disorders and factors affecting hormones, diseases caused by hormone dysfunction, the course of these diseases in adolescents, their conditions, the consequences of diseases, and their impact on cognitive processes. Information about the effects is provided.

INTRODUCTION

As psychological well-being, functional capacity, and the social and interpersonal aspects of medical illness gain increasing attention, the field of quality of life may offer new insights into clinical endocrinology. There is research evidence for an updated psychosocial understanding of endocrine disorders. For example, mental disorders of endocrinological diseases in children and adolescents and deterioration of the patient's

mental condition have been reflected in many studies. At the same time, there are many studies on the etiology, pathogenesis, clinic, and effectiveness of various methods of treatment of endocrinological diseases.

Epidemiological research data showed that 14% of patients with endocrinological diseases had only anxiety and sleep disorders. As a result, 17% had only depressive illness, and 36% had a combination of anxiety and depression.

In recent years, in medicine and medical psychology, there has been an increasing interest in studying the relationship between psychological and somatic factors in the beginning and progression of endocrine diseases. This is mainly due to socio-economic instability in our country, increasing unemployment, a decrease in the level of material well-being, environmental disasters, and an increase in the number of chronic diseases, including endocrine diseases. The chronic course of endocrine diseases significantly changes the patient's life and may lead to changes in his personality. The latter, in turn, affects the mental and social adjustment of patients and the entire system of their relationships; therefore, psychological assistance to patients is now becoming more relevant to prevent their social adjustment. At this time, the formation of a subjective picture of the disease takes place, which undergoes the most remarkable changes during its exacerbation. The crisis in the social situation in the development of this chronic disease, when personal conflicts and psychological protection become actualized, the whole system of patient relations is revised. At this time, it is necessary to carry out the psychological correction of its most essential aspects: the patient's attitude to his illness, his relationship with others, and his attitude towards himself. At this stage, it becomes the most crucial level within the patient's relational system, reshaping the course of disease exacerbation. Implementing this approach requires not only analyzing the patient's attitude toward the illness but also assessing its impact on their social adjustment.

Main part

Until now, most of the specialists in the field have studied and are studying the psychological characteristics of children with endocrinological diseases in a number of their scientific research. For example, even at the initial stage of the development of Psychoendocrinology and Endocrinology, in the middle of the 19th century, doctors noted the influence of endocrine glands on the human psyche. From the first definitions of endocrine diseases and other symptoms, changes in the psyche and character of patients were recorded. Thus, in the last edition of his manual of psychiatry (1920), E. Kraepelin distinguished a group of mental diseases under "endocrine poisoning" in the "Endogenous poisoning" section. However, a systematic study of changes in the psyche in various endocrine diseases began in the 40s of the last century by the

staff of the Zurich clinic headed by Manfred Bleuler. In 1954, his famous monograph, "Endocrinological Psychiatry," was published, and in 1964, a large section under the same name was published in the "Modern Psychiatry" manual. Psychoendocrinology as a scientific discipline appeared in the middle of the 20th century, along with other biobehavioral sciences, such as psychobiology, neurobiology, neuropsychology, psychopharmacology, and sociobiology.

In this regard, many local and foreign scientists have researched and observed the psychological characteristics of children with endocrinological diseases. Sonino and Giovanni A. Fava, A. Jacobson, M. Kovacs, P. Schreiner-Engel, Z.X. Meldiyeva, L.S. Giudice, R. Hauser, G.S., Soto A.M., Zoeller R.T., Gore A.S., Z. Laron, A. Galatzer, Groen, D.N. Isayev, Yu. F. Antropov, Yu.S. Shevchenko, Looslarni and Manukhina Natalya Mikhailovna in Russia on the topic "The relationship system of patients with endocrine pathology during the period of exacerbation of the disease," T. R. Bakhtadze, M.O. Smirnova, A.O. Zhukov these scientists on the topic "Endocrine diseases and psycho-emotional diseases observed in diabetes," V.V. Shevchuk on the topic "Disorders with endocrinopathies and the health of young people in the region with iodine deficiency," A.V. Vetibskaya on the topic "Secondary endocrinopathies: a promising direction in pediatric endocrinology," Kolomiets Irina Leodinovna "Emotional and behavioral problems of patients with diabetes and their mothers" conducted their scientific research on the topic of character traits.

To study the psychological characteristics of adolescents with endocrine diseases, an empirical study was organized and conducted. Within the framework of our dissertation work, 94 subjects were recruited, of which 50 (53%) healthy adolescents and 44 (47%) sick adolescents were recruited. (Figure 3.1)

Figure 3.1 Distribution of test takers

To determine whether our methodology meets parametric or non-parametric criteria, we analyzed the following results using the Kolmogorov-Smirnov criterion (Table 3.1).

Analysis of Kolmogorov-Smirnov's method of determining the level of anxiety of Ch. D. Spielberger, the version of the Eysenck questionnaire for teenagers, Burdon's test and Luria's 10 words methods

Table 3.1

Indicators	Kalmogorov Smirnov-Z	Trust level-p
Extrovert	1,484	,024*
Introvert	1,548	,017*
Neuroticism	1,403	.039*
Personal concern	1,681	.007**
Situational anxiety	1,459	,028*
Stability of attention	1,729	.005**
Attention span	,846	,471
Memory level	2,491	,000***

In our study, the extravert scale of the adolescent version of the Eysenck questionnaire (=1.484; $p<0.05$), inverted scale(=1.548; $p<0.05$), neuroticism scale(=1.403; $p<0.05$), Ch. D. Spielberger's method of determining the level of anxiety is personal anxiety(=1.681; $p<0.01$), situational anxiety(=1.459; $p<0.05$), d of

Bourdon method stress stability scale(=1.729; $p<0.01$), the memory level of Luria's 10-word method(=2.491; $p<0.001$) indicators did not correspond to the normal distribution law, so we will analyze these scales in our further analysis using non-

parametric criteria and it is appropriate to use the Mann-Whitney, Wilcoxon, Spearman, Kruskal Wallis criteria. Burdon's methodology distress portability(=1.459; p>0.05) scale normal did not conform to the distributive law therefore, we analyze this scale using non-parametric criteria and it is appropriate to use Mann-Whitney, Wilcoxon, Spearman, Kruskal-Wallis criteria.

Based on the goals and tasks of our research on the determined criteria, we will consider the differences according to the Manni-

Whitney criteria in order to determine the cognitive processes, anxiety scale, and typological characteristics of healthy and endocrine-diseased children.

Analysis of C. D. Spielberger's method of determining the level of anxiety according to the Mann-Whitney criterion, the version of the Eysenck questionnaire for teenagers, the Burdon test, and Luria's ten words method

Table 3.2

	A teenager	N	Average color	Z	r
Extrovert	healthy	50	64.10	-6,325	,000***
	sick	44	28.64		
	Total	94			
Introvert	healthy	50	23.57	-8,052	,000***
	sick	44	68.56		
	Total	94			
Neuroticism	healthy	50	33.87	-5,198	,000***
	sick	44	62.99		
	Total	94			
Personal concern	healthy	50	33,18	-5,446	,000***
	sick	44	63.77		
	Total	94			
Situational anxiety	healthy	50	44.80	-1,026	,305
	sick	44	50,57		
	Total	94			
Stability of attention	healthy	50	65.07	-6,036	,000***
	sick	44	32.04		
	Total	94			
Memory level	healthy	50	61.14	-6,143	,000***
	sick	42	29.07		
	Total	92			

Note: ***- $p < 0.001$

According to the Mann-Whitney test, significant differences were found between healthy and sick adolescents in the extrovert scale of the Eysenck questionnaire for teenagers, with the following indicators ($U = -6.325$; $p < 0.001$) appeared. Figure 3.2

Figure 3.2. The results of the analysis of the extrovert scale of the testers

Figure 3.2. The results of the analysis of the extrovert scale of the testers

The degree of extraversion and introversion in the human character is genetically programmed and related to metabolism characteristics. It is no coincidence that during the period of hormonal adjustment during adolescence, the extroversion or introversion of the character characteristic of the child from birth increases to the limit. Some teenagers feel free to hang out in different groups throughout the day, while others are alone.

An extrovert is an open-minded, expressive person with an active social position. His experiences and interests are focused on the outside world. Extroverts meet most of their needs by interacting with people.

Extroverts get energy from other people or are charged with it. He likes lots of interaction, activities, and involving situations. Extroverted teenagers are usually friendly and have an innate ability to meet new people. They feel comfortable in a group and quickly connect with people, including strangers. Conversely, they may feel bored and empty if they have to spend a lot of time alone. Extroverts are perceived as easy-going and open-minded people, often noted for their ease of communication and enjoyment of talking and socializing with others. They enjoy being the center of attention and are interested in activities that encourage interaction or in large groups. According to the analysis of our results, extroversion significantly prevailed in healthy adolescents. The leading activity of teenagers in their time is intimate communication. In this regard, the extroversion of teenagers is significant for this period. Adolescents with endocrine disorders are characterized by extroverted sociability and full of energy and the fact that they do not enjoy the noise, arguments, and communication in large groups, and they quickly get tired of them.

In our subsequent analysis, significant differences ($U = -8.052$; $p < 0.001$) were observed in adolescents on the introvert scale. Figure 3.3

Figure 3.3. The results of the analysis of the introvert scale of the testers

The size of the thyroid gland is small, but it is a large part of the endocrine system. It is located on the front surface of the neck in front of the larynx. Hormones produced by the thyroid gland coordinate the body's metabolism and are responsible for its growth and development. Deviations in the work of this organ can lead to disruption of the functions of the remaining endocrine glands. Currently, thyroid gland diseases are common among endocrine pathologies in children and adolescents.

Regulation of functions is the orientation of the intensity of work of life-supporting subsystems responsible for the performance of certain functions and the work of organs, tissues, and cells that support the work of subsystems. There are nervous, humoral, and myogenic mechanisms for regulating body functions. Humoral regulation consists of the coordination of physiological and biochemical processes carried out with the help of biologically active substances (metabolites, hormones, hormone ions) released during the vital activity of cells, organs, and tissues through the liquid environment of the body (blood, lymph, tissue fluid). Therefore, every psychological sphere of a person is closely related to his physiological psychosomatic sphere. The high level of introverted characteristics of sick adolescents in our results is hypothyroidism. This clinical syndrome occurs in cases of reduced or complete absence of thyroid gland function, which remains one of the most common thyroid diseases in children. Symptoms of hypothyroidism include a teenager who gets tired very quickly, does not like noises, falls asleep quickly, and promptly gets tired of interpersonal relationships.

In the results of our following scale, a high level of neuroticism was found in sick adolescents ($U = -5.198$; $p < 0.001$). (Figure 3.4)

Figure 3.4. the results of the analysis of the neuroticism scale of the examinees

Neuroticism describes emotional stability or instability. According to some data, neuroticism is associated with indicators of nervous system lability. Emotional stability is a characteristic that characterizes the maintenance of organized behavior in everyday and stressful situations and appropriateness of the problem. Emotional stability is characterized by maturity, perfect adaptation, lack of great tension, anxiety, as well as a tendency to lead and tact. Emotional instability in neuroticism is expressed by excessive irritability, instability, poor adaptation, tendency to rapid mood swings (lability), feelings of guilt and anxiety, busyness, depressive reactions, distraction, and instability in stressful situations. Neuroticism corresponds to emotionality, impulsivity, chaos in relationships with people, variability of interests, self-doubt, apparent sensitivity, impressionability, and irritability. A neurotic person is characterized by strong enough reactions to the stimuli that cause them. Adolescents with high scores on the neuroticism scale develop neurosis in unfavorable stressful situations.

Hyperthyroidism is a pathological condition in which the level of thyroid hormones in the blood is increased. These biologically active substances are involved in the regulation of metabolic processes and the maturation of the organism, as well as in the work of most organs and tissues. Their imbalance is perilous during childhood, when there is active physical and mental development. It often appears during adolescence. The development of hyperthyroidism in adolescence is associated with damage to the thyroid or pituitary gland, which regulates its work. If hyperthyroidism occurs during adolescence or shortly before the onset of puberty, children show a classic set of symptoms that are characteristic of an increase in thyroid hormones:

- nervousness, capriciousness, excessive aggression;
- deterioration of academic performance due to restlessness and impaired concentration;
- excessive sweating;
- trembling of the fingers;
- increased blood pressure and heart rate;
- increased frequency of bowel movements, periodic cramps, abdominal pain;
- increased appetite with rapid weight loss.

As symptoms, we can see the following: changes in appetite, hyperhidrosis (increased sweating) against the background of lack of thermoregulation, tremors of fingers, insomnia, nervousness, and psychomotor irritability. Patients suffering from thyrotoxicosis cannot control their emotions, are restless, nervous, and cry for no reason, experience constant anxiety and fear, and cannot concentrate. As a rule, mental illnesses are more common in girls than in men.

In the results of the further analysis of our study, we can see a high level of personal anxiety ($U = -5.446$; $p < 0.001$) in sick teenagers. (Figure 3.5).

Figure 3.5. A Pilot Analysis of the Personal Anxiety Scale

Anxiety worsens the adolescent's capabilities and performance, which in turn negatively affects the indicators of his personal development and his emotional state. Adolescents with high anxiety are more susceptible to the influence of stressful situations in the world around them and are prone to more frequent and intense anxiety experiences than representatives of a low level.

In particular, anxiety is associated with abnormalities in the thyroid gland in scientific medical and psychological literature. The thyroid gland synthesizes hormones with a wide range of effects that affect metabolism, heart and muscle function, and brain development. At the same time, the thyroid gland is sometimes under autoimmune attack. The immune system begins to synthesize antibodies against thyroid cells, and inflammation begins, which then affects the hormonal background.

The primary regulator of thyroid function is produced by the pituitary gland, a small gland located on the underside of the brain. TTG controls the production of thyroid hormones (thyroxine and triiodothyronine), which in turn regulate energy production processes in the body. The feedback mechanism allows maintaining a stable level of these hormones - when their amount in the blood decreases, the hypothalamus detects this fact and signals the pituitary gland to synthesize TTG. An increase in the concentration of TTG, in turn, stimulates the production of thyroid hormones by the thyroid gland. The reverse process happens in the same way.

Pituitary dysfunction can lead to an uncontrolled increase or decrease in thyroid-stimulating hormone levels, causing the thyroid gland to produce abnormal amounts of thyroxine and triiodothyronine. An increase in their concentration leads to hyperthyroidism and a decrease in hypothyroidism. Diseases of the hypothalamus, the regulator of TTG secretion by the pituitary gland, can also cause malfunctions in this system. In addition, thyroid gland diseases with disorders of thyroid hormone production can indirectly (through a feedback mechanism) affect the synthesis of thyroid-stimulating hormone, which leads to a decrease or increase in its concentration. As a result, anxiety and the inability to control emotions is a common disease in adolescents. In many cases, such teenagers perceive a threat to their dignity and life activity in various situations and react anxiously. This makes them prone to anxiety in various situations, especially when it comes to their self-evaluation.

The next of the selected research methods is the Burdon method, in which significant ($U=-6.036$; $p<0.001$) differences were found in the result of the stability of attention of healthy and sick people. (Figure 3.6)

Figure 3.6. The results of the analysis of the testers according to the Burdon methodology

At the age of 11-12, a teenager can consciously focus on boring activities. However, how long he can concentrate on the object depends on his genuine interest: the higher the interest, the easier it is to concentrate. Also, the pursuit of knowledge and the realization of the need for development will help the teenager to be attentive. Such motivation usually improves the teenager's attention, contributes to the increase in volume, and allows better control of his remaining characteristics. The emotions of teenagers and an unstable hormonal background complicate attention management. According to the analysis of our results, attention stability was high in healthy teenagers and low in teenagers with endocrine diseases.

The problem of iodine deficiency diseases related to the thyroid gland's pathology is one of today's urgent problems, especially in our climate. Iodine deficiency in the growing organism leads to hypothyroidism and goiter diseases, including physical, sexual, and mental development of the child. Cognitive and psychiatric disorders can range from mental retardation and mild mnemonic disorders (in some cases similar to the early manifestations of Alzheimer's disease) to severe psychotic disorders with delusions and hallucinations. In severe cases, patients become indifferent, the speed of mental processes decreases sharply, and speech slows down. In the neuropsychological condition, constructive praxis and visuospatial functions are revealed in addition to memory and attention disorders. This category of patients is characterized by central and peripheral sleep apnea; in the latter case, it can be improved against the background of hormone replacement therapy. Mild cases of iodine-deficiency encephalopathy now occur in almost 50 million children worldwide, causing an average IQ of 15 points. In the cognitive field, attention disorders, apathy, sleepiness, depression, as well as behavior disorders are detected in patients of this category. Iodine deficiency plays a role in a teenager's mental and physiological development. In addition to mental retardation, these patients usually have weight loss, dental pathology, thinning of the tongue, protrusion of the abdominal wall (usually in the presence of an umbilical hernia), and bone abnormalities.

Hypothyroidism slows down intellectual functions. The disease occurs spontaneously in them, memory defects are often observed (in particular, a decrease in short-term memory), and a

decrease in attention. Persistent sleepiness and lethargy are common symptoms. Patients have difficulty analyzing the events and phenomena that are happening around them.

Significant ($U=-6.143$; $p<0.001$) differences were also found in the cognitive processes of adolescents with endocrine disorders. (Figure 3.7).

Fig. 3.9 Results of the analysis on the memory level of the test subjects

The results show that the memory level of healthy teenagers and patients of a certain age showed a much lower result. We explain it as follows.

Memory is a person's characteristic that forms various knowledge, skills, and abilities. Various changes in memory formation occur at each age of a person. Fundamental changes in the memory process occur during adolescence.

The problem of adolescent memory development is relevant because adolescence is considered the best time for memory development. Important processes related to memory changes occur during adolescence. Based on the method of memorization, the ability to memorize freely increases constantly, but slowly until the age of 13, and from 13 to 15-16 years, there is a faster growth of memorization, which acquires a semantic, logical character. First of all, logical memory begins to actively develop in adolescents. They can engage in rational, introspection, and theoretical thinking during their activities. Adolescents begin to think freely about topics almost beyond a young student's understanding. Adolescence's most important intellectual achievement is the ability to work with hypotheses. As a reaction to the frequent use of logical memory, the use of mechanical memory slows down. Research shows that memory processes during adolescence still need to be sufficiently formed. As a teenager ages, the relationship between memory and thinking changes. If the child's thinking earlier depends on memory, then memory is conditioned by thinking in adolescence. The process of memorization is reduced to the process of thinking, establishing logical connections between the elements of information to be remembered, and recall consists of repeating the material behind these connections. For teenagers, remembering means thinking. The general level of memory development in modern teenagers is also much higher. However, based on this, it should also be said that not all students can memorize the same amount of material. Every learner's memory develops differently; everyone receives and encodes information according to their capacity.

The thyroid gland affects intellectual abilities in the first months of human existence. Even when the child's size is still less than 10 centimeters, the mother's thyroid hormones are actively involved in the formation of the unborn child's brain only in the first trimester of pregnancy. They affect minor mental abilities, hearing, and motor development. If the mother has an iodine deficiency, then there is a lack of thyroid hormones. As a result, the baby may be born mentally weak, deaf, with motor disorders. The intensity of these processes depends on how noticeable the iodine deficiency is: with a slight deficiency, a child is not born as intelligent and dexterous as possible. With this deficiency, severe mental retardation and complete deafness can develop.

Actively growing children and adolescents are usually included in a particular risk group for developing iodine deficiency diseases. A lack of iodine in the diet also reduces their intellectual abilities because memory, new skills, and the acquisition of thought processes require adequate levels of thyroid hormones in the body. It has been proven that the intellectual index (IQ) of children in iodine-deficient regions is, on average, 10-15 points lower than in areas with sufficient iodine in the environment. It is no coincidence that one of the first signs of iodine deficiency is a delay in learning; children have difficulty mastering the school curriculum.

In medicine, the term "cretinism" refers to a sharp delay in physical and mental development due to insufficient activity of the thyroid gland or lack of iodine in the diet. At the same time, not only the child's brain suffers, but also hearing, visual memory, and even speech. Pathology requires lifelong treatment by taking synthetic hormones.

The thyroid gland in adolescents ranks second in frequency among all endocrine pathologies. Girls suffer from thyroid diseases more often than boys.

Hypothyroidism is also a disease that negatively affects the development of cognitive processes in adolescence, and the disease is based on a decrease in the production of thyroid

Correlational analysis of C. D. Spielberger's method of determining the level of anxiety according to the Spearman criterion, the

hormones, which leads to functional changes in almost all internal organs.

Our subsequent analysis is a correlational analysis of the methods and results of the psychological empirical analysis conducted on the basis of our research.

According to the analysis of the results, we can see the patterns of dependence on several scales. Table 3.3

version of the Eysenck questionnaire for teenagers, Burdon's test and Luria's 10 words method

Table 3.3

	extrovert	an introvert	neuroticism	Personal concern	Situational anxiety	Stability of attention	Attentional shift	Memory level
Extrovert	1	,463**	-,474**	-,352**	,027	-,464**	-,562**	,466**
Introvert		1	-,393**	-,447**	-,181	-,512**	-,658**	,523**
Neuroticism			1	,342**	,045	-,359**	-,509**	-,424**
Personal concern				1	,034	,411**	,553**	-,309**
Situational anxiety					1	,080	,184	-,169
Stability of attention						1	,603**	-,395**
Attentional shift							1	-,535**
Memory level								1

According to this criterion, a positive correlation ($r=0.463$; $p<0.01$) was found between the extrovert scale and the introvert scale of the version of the Eysenck questionnaire for teenagers. Both introverts and extroverts have their strengths and weaknesses. It should also be noted that two extroverts or two introverts can be of different degrees (within an opposite range). In addition, everyone can pretend to be the opposite type, for which you only need to develop skills related to specific life situations. This result reflects the relationship between the two indicators.

A negative correlation ($r=-0.474$; $p<0.01$) was found between the extrovert and the neuroticism scale, according to which the neuroticism scale reflects a person's affective-emotional stability and affective excitability to one degree or another. , reflects its stability-instability. Extroverts feel comfortable in an environment of constant movement. Extroverts like to experience more emotions and new experiences. Extroverts can experience loneliness and feel empty when not interacting with people or the outside world. the higher the neuroticism scale, the lower the extroversion, or vice versa.

A negative ($r=-0.352$; $p<0.01$) correlation was found between extrovert and personal anxiety scales. All teenagers experience some degree of anxiety at some point. Anxiety is a normal stress response, but it can sometimes help teens cope with stressful or overwhelming situations. Teens can experience profound

emotions such as public speaking, graduation exams, important sports events, or reunions. They may also experience heart palpitations or excessive sweating. This is how the brain reacts typically to anxious feelings. However, for some teens, anxiety can go beyond these typical symptoms and negatively affect friendships, family relationships, and participation in extracurricular activities. When anxiety interferes, it should be considered that there are disturbances in everyday life. When adolescent extrovert traits are dominant, personal anxiety is definitely reduced because they are the center of attention in leadership-seeking circles.

A negative correlation exists between attentional bias and extrovert scale ($r=-0.464$; $p<0.01$) and attentional bias.

($r=-0.562$; $p0.01$), a negative correlation was found. Extroverts always focus on what they are interested in and want, and their attention characteristics can be high. If these attention characteristics go up, then the characteristics of extroverts in teenagers will decrease.

There was a positive correlation between memory level and extrovert scale ($r=0.466$; $p<0.01$), and memory power always plays a vital role in the active activities of extroverts. They always gain a reputation among peers and strangers for their optimistic and positive nature in relationships.

The introvert scale has a negative ($r=-0.393$; $p<0.01$) correlation with the neuroticism scale, and the following behavioral

characteristics prevail in an introvert: he often keeps to himself when communicating with people and faces difficulties in adapting to reality. In most cases, an introvert is calm and balanced; his actions are thoughtful and rational. His circle of friends is small. An introvert highly values moral standards, likes to plan the future, thinks about what and how to do, does not give in to quick impulses, and is pessimistic. An introvert does not like excitement and follows the order of life. He strictly controls his emotions and rarely acts aggressively. Therefore, when their neuroticism increases, introvert characteristics decrease or vice versa.

There is a negative correlation between the personal anxiety scale and neuroticism ($r=-0.447$; $p<0.01$), according to which neuroticism is formed by many factors: external factors (physical stimuli of various levels) and internal (biogenetic predisposition, current psychological state). Neuroticism perfectly manifests itself in self-control, keeping negative emotions in oneself, and controlling emotional outbursts. An increase in anxiety in a person leads to a decrease in neuroticism.

The introverted scale proved to be negatively correlated with divided attention ($r=-0.512$; $p<0.01$) and attention shifting ($r=-0.658$; $p<0.01$). There is a complex relationship between attention and the orientation of the individual. In the same situation, different objects can be the focus of attention of other people. Determining and choosing the objects of mental activity depends on the general direction of the person and the direction of his consciousness at the moment, which is the source of the relations of the chosen person, on the selectivity of his mental processes and all his activities. Introverts are not interested in objects but rather in the relationships between objects and how they interact with them. He perceives the truth through his ideas and compares them with his inner world, attempting to modify objects without affecting their relationships. Conforms to other people or persuades them to change to save the relationship. That's why introvert characteristics prevail when their attention characteristics decrease.

A positive correlation was found between the level of memory and the introvert scale ($r=0.523$; $p<0.01$), and introverts are more successful in activities related to the reception and processing of certain information and the reception of uncertain information, and are less successful in recycling activities. Introverts are said to find learning easier than extroverts. However, it should be noted that despite the important typological differences that characterize the educational activities of introverts and extroverts, this typology is in no way related to the level of potential.

Neuroticism and personal anxiety are positively correlated with each other ($r=0.342$; $p<0.01$), in which an increase in the level of personal anxiety, neuroticism leads to uncoordinated activity in many areas of the psyche: affective-emotional, communicative, moral-volitional, cognitive-mnemonic, in general, it leads to a decrease in the quality of life.

An increase in the level of neuroticism reflects the individual's emotional instability and lability. It also indicates the balance of mental processes, self-arousal, reactivity, high sensitivity, and a low threshold for experiencing physiological and psychological stress.

Scales of stability of attention ($r=-0.359$; $p<0.01$) and division of attention ($r=-0.553$; $p<0.01$) and memory level ($r=-0.424$; $p<0.01$) and neuroticism A negative correlation was found between Neuroticism is manifested in high neuroticism, inability to adapt well, mood swings, lability, feelings of guilt and inattentiveness in attention and memory, indifference to stressful situations. When these characteristics are high, attention characteristics and memory levels will decrease and vice versa.

Personal anxiety has a positive relationship with the division of attention ($r=0.411$; $p<0.01$) and attention shifting ($r=0.553$; $p<0.01$), which shows that anxiety can be used in various life situations. it can be considered as a personal characteristic that manifests itself in non-objective situations. It is characterized by a state of incalculable fear, a sense of infinite threat, and readiness to perceive any event as uncomfortable and

dangerous. A teenager tries to be more attentive to himself in his anxious situations (communicating, recognition, high evaluation from the outside). Therefore, these scales were found to be positively correlated.

We can see that the level of memory has a negative correlation ($r=-0.309$; $p<0.01$) with personal anxiety. The ability to control the level of anxiety allows you to optimize the process of detailed recall of past events. It was also found that memories can have a negative color when anxiety reaches its highest values or when neutral elements of the experience begin to be associated with a negative context with the transition to a feeling of fear. A high level of anxiety reaches the critical limits of its manifestation, which creates the basis for negative consequences related to memory mechanisms and the performance of specific actions. When anxiety goes down, the level of memory goes up and vice versa.

The stability of attention itself has a positive correlation ($r=0.603$; $p<0.01$) with the mobility of attention. Attention is significant in human life. Attention is a necessary condition for any activity. This is the attention that thoroughly performs all our mental processes and allows us to perceive the world around us. Attention is the basis of successful cognitive activity and is an essential mental process affecting students' success in learning activities. It depends on the characteristics of attention that the child can quickly switch from one activity to another, how long he can work with the same material, how clearly he can distinguish and examine the object, and study it for a long time. Features of attention are closely related to each other, and it is difficult to separate it from other cognitive processes. The direction and duration of mental activity depend on how much attention is developed.

It was proved that the level of memory has a negative correlation with stability of attention ($r=-0.395$; $p<0.01$) and shift of attention ($r=-0.535$; $p<0.01$). Memory and attention processes are constantly interconnected and require each other. Of course, we can see the dependence of memory up or vice versa when the characteristics of attention decrease.

CONCLUSION

In conclusion, many changes are observed in the psyche, behavior, cognitive processes, and emotional states of children with diseases of the endocrine system. The role of a psychologist is very important in this. The role of a psychologist (psychotherapist, in some cases a psychiatrist) is shown to be very important as soon as a qualified specialist can help in conducting psycho-rehabilitation activities. In some cases, short forms of individual psychotherapy may be indicated. "Group therapy" may also be beneficial for older patients with the same disease (e.g., pituitary pathology).

Emotional connection, receiving and sharing information (with the participation of endocrinologists in some sessions), relaxation, and planning for the future can encourage patients to build their thinking on the principle of the "adaptive approach," but I disagree; I spend time on analysis of potential risk and consequences of endocrinological disease capable of losing work capacity. We believe it is appropriate to report on a pilot study in which group therapy had a positive effect on women with menopausal syndrome. A qualified psychologist can provide advice and support to spouses and family members of patients at various stages of endocrinological treatment. This is one of the main tasks of a psychologist.

In addition, currently, there is no complete understanding of psychotherapeutic support as a means of psychosocial and psychological rehabilitation of patients with endocrine diseases. The psychotherapy of endocrine patients should be systematic; it should be a set of techniques and methods aimed at encouraging patients to adequately control the disease and get rid of psychopathological symptoms (by solving deep personal conflicts).

Mental disorders present in patients with endocrinological pathology are of great clinical importance. Susceptibility to stress and depression in patients with endocrine disorders has been widely studied. A common mistake in such cases is to treat

depression as “understandable under the circumstances” and not attempt to treat it.

This article discusses the psychological characteristics of adolescents with endocrine system diseases, the functions of the endocrine system, disorders and factors affecting hormones, diseases caused by hormone dysfunction, the course of these diseases in adolescents, their conditions, the consequences of diseases, and their impact on cognitive processes. Information about the effects is provided.

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