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DOCTORATE THESIS

SUMMARY

THE PLURIFACTORIAL DETERMINISM OF HYPERCHOLESTEROLEMIA: PERSONALITY TRAITS, PSYCHOPATHOLOGICAL TENDENCIES, DISTRESS AND COPING STRATEGIES

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1. Psychosomatic conception. Historical reference points

The unity of the individual regarding the two aspects – psychic and somatic – represents a very old preoccupation and conception, many of the doctors of Antiquity affirming this connection. Thus, Erasistrate, taking Antiochus' pulse and noticing its acceleration in the presence of steadfastness highlights that the "fever of which this prince was suffering, had as only cause the hopeless love the beautiful queen had inspired in him" (Athanasiu, 1983, p.49).

The role of psychological traumas in the appearance of some diseases has been observed since the eldest of times. In the old Romanian medicine there is a great importance given to the psychic causes in the genesis of many ailments. Somatic diseases, exclusively psychogenic, such as "the scare", disease derived from scare, with fever and convulsions, which was cured through disenchantments, but also by smoking with wolf hair, have been described. There are other examples of psychogenic somatic diseases; the "worriment" disease, the "broken heart" disease, the "desire" disease etc. A big part of the diseases described by the old Romanian medicine are somatic diseases induced by psychogenic factors (Văleanu, Daniel, 1977).

The importance of "moral causes" in the apparition of somatic disorders was affirmed by the European doctors of the XVI-XVII centuries, a series of doctrines remained famous through the role given to the psychic life in the genesis of maladies. Such is the doctrine of animism, of the esteemed doctor Georg Ernest-Stahl: he affirms that the soul represents an essential factor of health and disease. In the XVII century, Sydenham imposes the distinction between the organic and psychic nature of an ailment illustrated clinically through similar symptoms, and Baglivi's ideas underline that emotions are not just a concomitant of somatic disorders, but also their direct cause, because "a great part of diseases originate or are fed by the worries on everyone's shoulders". (Ionescu, 1975). Among the founders of modern psychosomatic lies Heyer, who demonstrates the modification of the internal organs functions through the action of psychic factors.

1.1 Etiology of psychosomatic diseases

The notion of psychosomatic disorders is given to some functional prejudices in the body, which have no organic cause; there are no lesions or neurological disorders, there are no infections, yet there is an imbalance in the organism's health state. In these cases, the

unconscious disarray from a psychological point of view lies at the base of functional physiological disorder. (Dolto, 2005).

The psychosocial factors are known since the Antiquity, being recognized in pathogenesis, especially in psychopathology only in our century because of the difficulty to replicate them in experimental studies. Levi and Kagan (cited by Mihăiescu, 1996) also affirm that psychosocial factors can and cause physical diseases. As psychosocial factors are considered the general aspect of society, cultural inheritances, values, norms, traditional conflict solving techniques, beliefs etc. (Mironţov et al, 1986).

In the works of H. Selye it is proven that the organism reacts, in case it is threatened, by mobilizing defense mechanisms. Persistent emotional tensions or emotional shocks produce somatic effects. Consequently, it can be understood that deceptions, emotional isolation, failures in general represent just as many causes regarding organic diseases. The fact that there is a somatic reaction towards emotions is already known, and from this viewpoint especially those who exteriorize their emotions less are likely to produce neurovegetative and endocrine responses at alarming rates.

The connection between psychic and body belongs to Freud, who defined conflict as a pathogen psychic agent, introducing the term of conversion to highlight the mechanism of the connection between somatic and psychic. Anxiety, for Freud, prevents the ego from a conflict between two opposed tendencies. Anxiety and anguish are at the base of psychopathological mechanisms of psychosomatic symptoms.

Another psychogenic factor is frustration. Frustration is the essenţial reason lying at the base of human behavior, representing the situation in which an obstacle changes an individual's conduct. (Delay and Pichot, cited by Cucu, 1980). The consequences of frustration are perceived as anxiety, hate, anguish, aggressiveness etc. In Sivadon's (cited by Enăchescu, 2008) vision, frustration represents a situation which opposes achieving a behavior.

Pavlov demonstrates the influence of cortical, conditional and unconditional factors, which influence visceral reactions, and Lachman's (cited by Băban, 1992) model focuses on behavioral interpretation and according to this model the emotional reactions ought to be frequent and/or prolonged in order to gain a pathogenic significance.

To the progress of psychosomatic have also contributed Dunbar and Alexander. Dunbar (cited by Văleanu and Daniel, 1977; Băban, 1992) affirms that chronic tension would be translated through vegetative and somatic imbalances in case the emotions cannot manifest. He outlines personality profiles for various diseases.

In 1934 Alexander formulates the "specificity hypothesis" of emotional conflict, meaning that the emotional psychological factors which determine somatic diseases have a specific nature, and the conscious psychic processes have a subordinate role in the apparition of somatic symptoms.

Kobasa (cited by Băban, 1992) brings new arguments regarding the impact of psycho-behavioral traits in pathology, and R. Kovrilski describes a type of personality characterized through "stress vulnerability". Engel and his collaborators (cited by Gelder et al, 1994) consider the complex of waiver and concession, as a response to loss or threat, a factor in the occurrence of psychosomatic diseases. Nemiah and Sifneos (cited by Ionescu, 1975; Tănăsescu, 2008) consider alexithymia the cause of psychosomatic suffering.

In conclusion, psychosomatic symptoms and diseases result from a multifactor chain coupling with specific and unspecific elements which imply multiple reactions, in which the psychic – body relation is mediated by sociocultural factors.

1.2 Stress and psychosomatic diseases

An English word at origin, stress refers to a situation regarding the imbalance of the organisms' homeostasis under the action of some physical, chemical, biological and psychic factors. He operates primordially in the psychic sphere through the significance it has for the person, the stress effect targeting the psychophysiological unit of the person, is essentially of psychosomatic nature (Sîrbu, 1979).

Regarding psychic stress, it represents a particular case of stress, being unleashed by psychic agents. These can have a negative significance (distress) or a positive one (eustress), and it operates in the plane of consciousness only after their decoding and the evaluation of the "task" laid before the individual. (Iamandescu, 1997). The intrapsychic stressors refer to the conflicts between motivations, intrapsychic conflicts etc. M. Golu defines psychic stress as being a state of tension, strain, and discomfort, determined by affectogenic factors with negative significance, by frustration or repression of some motivations, needs, desires, aspirations, the difficulty or impossibility of solving certain problems. (Iamandescu, 1999).

In the last decades studies on ethiopathogenic factors with a role in the occurrence of various diseases (pollution, sedentariness) have included psycho-behavioral factors as risk factors in pathology. These factors known as psychic factors play an important part in neurotic and psychosomatic diseases, as well as in chronic degenerative diseases.

The concept of psychic stress introduced by Selye refers to the unspecific reaction of the entire organism in moments of threat for psychic and somatic homeostasis. Hans Selye has utilized this term to designate an "external action of overstrain exercised on the organism by a large number of physical, chemical, biological, psychic causal agents, able to produce an ensemble of morphofunctional modifications". (Iamandescu, 1997, p.44). In case of some intense, prolonged actions of the stressor agent these modifications gain the form of something Selye called in 1936 "General adaptation syndrome (GAS)", which describes the changes (hormonal, biochemical etc.) which occur in the organism and which interact with psychological factors. (Malim et al, 1999). GAS comprises "the total of unspecific mechanisms able to assure the mobility of adaptive resources of the organism when faced with aggression threatening its morphological integrity, or its humoral constants". (Iamandescu, 1997, p.44).

2. Cholesterol and hypercholesterolemia

Cholesterol $C_{27}H_{45}0H$ is the most important sterol from a biological standpoint, being first isolated from the gallstones which contain 75-90% cholesterol. (Oieriu, 1956). It is an organic alcohol identified in the cellular membrane and in the organism's tissues, transported in blood. It is regularly absorbed through alimentation. It is concentrated in the liver, marrow, and brain, having an important role, numerous chemical processes having it as a forerunner.

Cholesterol has numerous functions in the organism; it participates to the building of lipoproteic cellular structures and of soluble lipoproteins, it is the precursor of steroidal, adrenocortical and gonadal hormones, and it contributes to the synthesis of D3 vitamin.

The necessary cholesterol is produced in the organism without the need of food intake. The quantity in blood is influenced by alimentation, and it is recommended that the daily quantity of 300 mg cholesterol should not be exceeded. (Oberritter, 1998).

The increases in cholesterol level are owed to the genetic predisposition and unhealthy food habits. It also depends on the body weight, age, physical activity and level of estrogen hormone. Stress and sadness are also important factors regarding the level of cholesterol.

3. Emotion and stress adaptation

3.1 Affectivity. General notions and theories of affectivity

Affectivity is a fundamental element of the human psychic, which participates to behavior, just like cognition. The man does not take part to life's events in a passive way, on the contrary, when meeting with situations and phenomena these have an impact on him, awaking his needs, satisfying his interests and some desires or not. In the frame of affective processes, the objects itself is not important, the significance given to it is. This suggests that when our expectations are met we will have positive feelings, and when they are not met we will have negative feelings.

Because affectivity is a pulsional process, it does not have operatory structures, but we can talk about emotional reactions, some of them innate, some gained through conventionalizing, imitation and learning.

The characterization of affective states and their denominations are extremely varied. Pavelcu (1937) affirms that "each author uses his own terminology". (Cosmovici, 1996, p.220). G. Debus subscribes to this by using the term "feelings" and Fr. Littman calls them all emotions. (Cosmovici, 1996).

Under the aspect of genesis, emotional life anchors itself in the biophysiological, but it is also determined by the socio-cultural motivational systems. There is no behavioral manifestation or mental state that isn't sustained by organic processes. "There is no thought without brain, nor behavior without body". (Cosnier, 2007, p.19).

There are two large levels of affectivity from the angle of complexity and motivation, namely:

- Basal affectivity (holotimic) which comprises the primary emotions (elementary affective states, dispositions, emotions);
- Elaborated affectivity (catatimic) – according to H.W. Maier (cited by Gorgos, 1985) – which comprises secondary emotions (passions, feelings).

The two levels do not act independently, but in a tight correlation, ensuring this way a linear process.

There are numerous theories which explain emotional feelings; for example the "peripheral theory" of James (1884) (cited by Birţ, 2001), which says that the origin of emotional feelings lies at the muscular and visceral levels, due to the modifications under the influence of pleasant or unpleasant stimuli. Afterwards, Wenger (1950) (cited by Birţ, 2001), makes a connection between emotional feelings and emotional behavior, and Canon (cited by

Birţ, 2001), highlights the importance of the hypothalamus as a place where the emotional tonality is achieved. In their attempt to explain emotional feelings, Papez (1937) and Lindsley (1950) (cited by Birţ, 2001), have brought important contributions.

Within the emotional process there are a series of organic vegetative modifications: in the EEG picture, at the level of cardiac activity and circulatory system, at gastrointestinal level (fear, irritation inhibits movements, surprise emphasizes them), at respiratory level, also the skin's electric conductance modifies itself; changes also appear in the blood's chemical composition, targeting adrenalin, sugar etc. These changes appear simultaneously or secondary to emotional feelings and they are produced by the participation of the nervous vegetative system through its two segments, sympathetic nervous system (SNS) and parasympathetic nervous system (PN), to which the endocrine system also contributes.

3.2 Stress adaptation. Coping strategies

The term "adaptation" has different meanings in biology, physiology and psychology. Prosser (cited by Floru, 1974) understand through physiological adaptation the organism's capacity to adapt in a specific environment. For Lazarus, "psychic survival" assumes adaptation to norms, social pressures etc., resulting from the interdependence with others, but also keeping track of internal pressures and needs (Floru, 1974). Adaptation is possible through changing of organisms (autoplastic adaptation) or through changing (transforming) the environment (alloplastic adaptation). Superior forms of adaptation are represented by psychic and social adaptations. Adaptation and health are in general two tightly bound notions; health being considered a successful adjustment, while disease represents a lack of adjustment. (Angheluţă et al, 1986). Starobinski (1974) believes that "normal reactions" to the environments requests are characterized through appropriate answers, with action from the inside to the outside, and "pathological reactions" have the form of vicious circles with activation from inside to the inside also. Therefore adaptation is an attribute of health, but a certain degree of adaptation is also possible in disease. (Angheluţă et al, 1986).

Numerous studies highlight the connection between stress and coping mechanisms. Thus, J. N. Souza et al. (2009), in a study investigating chronic stress, have come to the conclusion that people using coping strategies based on emotions had a higher level of stress. Diane L. Padden (2006) reveals that the ability of military wives to adapt is dependent on the cognitive assessment of events and personal resources. Mc. Creary et al (1995) claim that in order to

obtain work satisfaction, the most efficient method is to avoid stress. This strategy presumes avoiding persons associated with stress. Nita. C.Hawk (2008), examining perceived stress and the coping mechanisms used by school supervisors, discovered that there is a statistical difference between the types of coping used by men and those used by women, but there is no evidence that there would be differences between the types of perceived stress factors.

In case of people with spine lesions it is recommended that they get involved in constructive activities; establishing important long-term goals that can insure their motivation and zest for life. (DeGraff, 2008).

Stress has a powerful impact on anxiety and depression over a longer period of time. Debra K.Gustafson (2006) highlights the fact that children with deficient coping are more vulnerable to anxiety.

Regarding the predilection towards a specific type of coping mechanisms, reported to age, Kelly Linda Louise (2006), affirms that older subjects tend to rather use proactive coping techniques.

In the process of adaptation, life events continuously model an individual's structure, being able to generate particular, pathological conditions.

There is a process ensemble which intervenes in adaptation, taking place at various levels: somatic, physiological and psychic.

According to Lazarus and Folkman (cited by Tănăsescu, 2008; Lazarus, 2011), coping is a cognitive and behavioral effort to master and reduce internal and external solicitations which surpass personal resources. H. Bloch (cited by Zlate, 1999) defines coping as an active process through which the individual surmounts a stressful situation, based on self-assessment of activities and own motivations. According to the cognitivist paradigm, coping implies a conscious effort regarding the manner in which the stressful event is perceived, processed and stored, but also a certain processuality materialized by anticipating a situation, the confrontation itself and reformulating the situation, afterwards a post-confrontational analysis regarding the personal significance of the situation.

Floru (1974) highlights the fact that experience gained by the individual in its efforts to accommodate to the situations can be adaptive. It may though be that the organism, the person, would use an inadequate adapting manner, thus transforming the process of adaptation into an etiopathogenic element. Selye speaks this way of "adaptation errors or, precisely, erroneous answers in the adaptation tendency". (Ionescu, 1975 p.57).

There are two basic emotional attitudes in case of confrontation with a situation:

- "fight or flight" readiness in case of a situation of imminent danger;

- Retreating from the outwards oriented activity. (Alexander, 2008 p.70).

According to these attitudes, the emotional disorders of vegetative functions will also have different aspects,

In the process of adaptation some immunogenic personality traits can be implicated, for example the locus of control. The term is so called by Rotter (1966), designating the way through which the individual explains his personal success or failure, by invoking internal or external causes on which he may or may not have control over. In other words, it represents the person's perception regarding the causes which determine punishments or rewards related to his behavior.

3.3 Somatic concomitances of affective processes

The comorbidity between somatic diseases and psychic disorders represents a clinical reality, analyzed and interpreted from various perspectives. The domain of biological psychiatry offers numerous arguments targeting the involvement of biological mechanisms in the etiopathogeny of psychic disorders, recognizing at the same time the importance of psychological factors in the occurrence of somatic ailments. (Iamandescu, 2009).

Not all individuals react through disease to some situations, only those who are part of a psychological typology.

Psychic aspects that can generate organic diseases are: deceptions, conflict situations, feelings of guilt, frustrations etc. According to Galen's observations (2nd century), depressed women presented a higher risk of contracting cancer, and thereafter in the XVIII-XIX centuries some studies revealed sadness and depression as factors emphasizing this malady. James Paget (1870) affirms that profound anxiety, lack of hope and disappointment constitute important factors in the apparition and development of cancer. (Paget, 1870 apud Leader, 2007). A profile is described of a patient suffering from cancer in which the will to help others, the inability to express aggressive feelings and playing the part of a martyr are essential. In the case of breast cancers, Steven Greer from King's College in London claims that, according to studies, there is a correlation between this malady and excessive control of hostile feelings, correlated with lack of emotional expression. (Greer et al, 1975 apud Leader, 2007).

There are numerous diseases with psychosomatic implications: for example in case of cardiovascular diseases, the tight correlation between anxiety and anger on one side, and the

heart's activity on the other side is well known. In essential hypertension most studies underline the fact that inhibited hostile tendencies play an important part in this phenomenon; according to Cannon's observations, anger and fear create an increase in blood pressure in the experimental animal. It was shown that inhibited chronic aggressive drives, which are always associated with anxiety, significantly influence the values of blood pressure. (Alexander, 2008). Psychological characteristics such as depression, anger, hostility, anxiety influence the metabolic system by acting on some physiological pathways, especially the HPA axis. (Goldbacher, et al 2007). Numerous studies indicate the fact that major depression constitutes a risk factor in type II diabetes.

Dysmenorrhea is also attributed to the existence of some psychic conflicts, noting that its underlying emotional processes are "way too complex to be created in an experimental situation". (Horney, 2012 p.197). Regarding the emotional factors in metabolic and endocrine disorders, the first researchers of this issue claimed that a severe emotional shock could be responsible for the development of a form of thyroids called "Basedow shock".

In case of allergic patients, the feeling of emotional insecurity and attachment towards the mother are defining traits. They do not support the coexistence of closeness and distance in interpersonal relationships, they have an inhibited aggressiveness and keep themselves at distance through compensatory methods. (Luban-Plozza et al, 1996). In emotional diarrhea, the personality is marked by the fear of authority and the feeling of dependency. Chronic constipation is present in anxious and depressed subjects. They seem careless, but are tense on the inside and have a low morale. Freud speaks about them in terms of stubbornness, discipline and moderation.

The skin is considered the human's psychosomatic organ, several inner conflicts are based at its level. For example in hives, Masaph (cited by Luban-Plozza et al, 1996) highlights, as defining traits of these patients, the tendency towards passive attitudes, vulnerability in relationships and insecurity.

The patients with headaches frequently hide a mix of feelings in which hostility and envy predominate, according to Fromm-Reichmann. (cited by Luban-Plozza et al, 1996).

In case of the muscular and skeletal system, experience shows that emotional factors play a part in the onset and evolution of the disease. Thus, Schild (1972, 1973) (cited by Luban-Plozza et al, 1996) emphasizes the influence of emotional conflict in the evolution and exacerbation of herniated disc, as well as narcissistic personality traits in patients with ankylosing spondylitis.

Research has shown that anxiety and stress contributes to diminishing the resistance of gingival tissue, being able to create pathology this way. (Mihăescu, 1996).

4. Personality evaluation. Definition and characteristics. Orientations and theoretical models in the study of personality

The notion of personality expresses the unitary, synthetic and individual character of a person, it is a synthesis of individual psychic traits originating in inherited predispositions and especially in acquisitions gained throughout the evolution of man. (Predescu, 1976). It can be hardly defined because of its complexity; there are even some statements about the impossibility of being defined. (Hamilton cited by Predescu, 1976). The study of personality grew in reply to an excessive analytic character and unilateral interpretation of some psychic aspects or processes (Predescu, 1976).

Throughout time there have been many definitions given to the notion of personality, it bearing a variety of meanings. In specialty literature there are numerous definitions of personality, each capturing some aspects of this concept. For psychology, the personality is a quality each human individual can gain in a certain stage of development, by meeting some defining characteristics or notes.

The first to try and classify the individuals was Hippocrates, in a period in which it was thought that the type of fluid predominating in the organism determines the character. Thus the following personality types have resulted: sanguine, lymphatic, choleric and melancholic. Over time many authors have defined the concept of personality; thus, for Pieron (1963) personality represents an integrative unit summing its permanent differential characteristics (intelligence, character, temper), as well as own ways of behavior; W. Stern (the founder of personology) sees personality as a "functional, structured, finalistic oriented whole, articulated in a hierarchical system of persons", and for Nuttin personality represents the ensemble of psychic organization comprising aptitudes, cognitive functions, character and physical aspects of the individual. (Dragomirescu et al, 1990 p.165).

Another perception belongs to S. Freud, who described the structure of personality as being based on three elements: the id, represented through our biological, universal impulses which need to be satisfied, the ego, that part of the person in contact with reality, and the superego or conscience. In this sense, Freud defines personality under a dynamic aspect, meaning the movement of "psychic energy", of the libido between the three instances. The

pressure of a compulsion with its potential for new experiences, behavior etc. determines and differentiates a general style of functioning.

Most theoreticians reveal as a common point in defining the concept of personality the attribute of unity, integrality and structurality. The important characteristics of personality are: globality, coherence, temporal permanence (Dafinoiu, 2002), and Melanie Kleine (Dragomirescu et al, 1990) affirms that these would be: emotional maturity, strength of character, ability to face emotional conflicts, continuous oscillation between inner life and adaptation, as well as an integrated concept of self.

Personality can be approached from varied perspectives and directions. After M. Golu (1993) in the study of personality are four main orientations delimited: biologist orientation, experimentalist orientation, psychometric orientation, and the socio-cultural and anthropologic orientation.

From the numerous theoretical models existent in the specialty literature we highlight S. Freud's psychoanalytical school, and the psychometric school mainly represented by G. Allport, R.B. Cattell and H.J. Eysenck.

Freud defined the structure of personality in terms of unconscious, preconscious and conscious, this being the topographic model. In his opinion, the unconscious area – which sums up conflicts, emotional traumas etc. – influences the behavior of people. The psychoanalytical orientation initiates a holistic model of approach of an ensemble or a whole which constitutes personality itself, different from the traditional, analytical one.

The psychometric school had as important supporters R.B. Cattell, H.J. Eysenck and G. Allport. This school's objective was the study of what individuals have in common, and the identification of traits or personality types. The attempts to define the personality, as presented by G. Allport, constitute the essence of the dispositional model or of the personality traits.

The traits are not observed in the behavioral flux, according to Allport they are defined as determining tendencies or predispositions to respond in a specific way, these imprinting a unique mark to more responses addressed to certain stimuli.

The dispositional model was consolidated by the contribution of another famous name, namely Hans J. Eysenck; he began from the typology proposed by Jung (extroversion-introversion), and from Kretschmer's constitutional dimensions, thus proposing a factorial vision on personality. He uses the factorial analysis in measuring and ranking traits.

4.1 Personality traits of people suffering from hypercholesterolemia

There are numerous studies demonstrating the connection between stress and high level of cholesterol in blood.

Andrew Streptoe and Lena Brydon from University College London have conducted a study targeting the way in which individuals react to stress and whether their reactions can lead to an increase in the level of cholesterol. Catherine Stoney (1997), in her study, shows that factors like fat intake from diets, waist-hip ratio and perceived stress have an influence on the level of bad cholesterol (LDL) in men.

Hostility is a toxic emotion which, over time, increases the level of adrenalin, which in turn increases cholesterol and creates a permanent state of agitation, affirms David Beales, specialist in behavioral medicine. Also, some researchers have emitted the hypothesis that low levels of cholesterol due to medication are associated with a negative emotional state, and these states can manifest as hostility. (Muller et al, 1995 apud Dawn L. Wilson et al, 2001). Golomb R. A. et al (1997) approach the same problem in their study, underlining that in case of using medication from the statin class to reduce cholesterol, manifestations of severe irritability can occur (murderous impulses, destruction of property, threats).

Extrovert personalities present a lower stress level, which also influences the level of cholesterol.

Researchers from Toronto and Paris have discovered that anxious persons are prone to develop unhealthy dietary habits which can have consequences on the level of cholesterol.

Sensitive men, showing compassion and empathy, have a lower stress level according to researchers from the University of Glasgow, which can have a beneficial impact on the cholesterol level.

Researchers at the University of Edinburgh affirm that a low intelligence coefficient is associated with an anxiety risk and posttraumatic stress disorders; this stress can influence the levels of cholesterol through its effects.

There is also a theory according to which sociability plays an essential part in reducing the level of stress hormone, called cortisol, which contributes to the disruption of the HPA axis, suggesting the idea that psychological factors have an impact on the immunity system's functioning. (Chrousos et al, 1998 apud Leader, 2007).

The authors of a study conducted at Harvard University claim that unhappy people (D personality type) don't have well-regulated stress hormones, which can affect the level of cholesterol.

People with a neurotic personality very frequently use strategies that imply a lower rate of reality regulation, they often self-accuse and they are more hostile. They become stressed, being therefore vulnerable to some diseases. (Savu, 2009).

Studies have demonstrated that people with a cynical tendency live in a continuous state of stress, which leads to the modification of the secretion of a protein called C3, which in large quantities can lead to metabolic and cardiovascular diseases. Other researchers have shown that positive persons, clearly knowing their goals in life, have low levels of stress hormones.

Also, cholesterol seems to be connected with the negative symptoms in schizophrenia (Brice, 1935 apud Hillbrand et al 2000), of dysphoria (Ketterer, 1997 apud Hillbrand et al 2000) or the risk of suicide (Hillbrand, 1999).

The level of cholesterol in the blood may rise after event such as retirement, certain losses etc., situations that can consciously or unconsciously diminish the joy of life, according to J. Martel (2012), from a perspective targeting the subtle causes of diseases.

Highlighting personality traits is important in the adherence to treatments decreasing cholesterol. Depression, anxiety, mental flexibility, operational capacity are significant factors which correlate with adherence. (Stilley et al, 2004).

5. Methodological frame

5.1. Objectives and hypotheses

1. Objectives and hypotheses for the correlational study

Objectives

5.1.1. Establishing the association between stress and certain personality traits (neuroticism, anger as a state and trait, feeling of control) in people with hypercholesterolemia.

5.1.2. Establishing the association between stress and psychopathological tendencies (psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with hypercholesterolemia.

5.1.3. Establishing the association between stress and coping mechanisms (problem-oriented, emotion-focused, and dysfunctional) in people with hypercholesterolemia.

5.1.4. Establishing the association between some personality traits (neuroticism, anger as a trait and state, feeling of control) and psychopathological tendencies (psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with hypercholesterolemia

5.1.5. Establishing the association between some personality traits (neuroticism, anger as a trait and state, feeling of control) and coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia

5.1.6. Establishing the association between coping mechanisms (problem-oriented, emotion-centered, dysfunctional) and psychopathological tendencies (psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with hypercholesterolemia.

5.1.7. Establishing the association between coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia.

Hypotheses

5.1.8. There is a significant correlation between stress and some personality traits (neuroticism, anger as a state and trait, feeling of control) in people with hypercholesterolemia.

5.1.9. There is a significant correlation between stress and psychopathological tendencies (Psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with hypercholesterolemia.

5.1.10. There is a significant correlation between stress and coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia.

5.1.11. There is a significant correlation between different types of personality traits (neuroticism, anger as a state and trait, feeling of control) in people with hypercholesterolemia.

5.1.12. There is a significant correlation between different types of psychopathological tendencies (Psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with hypercholesterolemia.

5.1.13. There is a significant correlation between some personality traits (neuroticism, anger as a state and trait, feeling of control) and coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia.

5.1.14. There is a significant correlation between psychopathological tendencies (psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) and coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia.

5.1.15. There is a significant correlation between coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in people with hypercholesterolemia.

2. Objectives and hypotheses for the comparative study

Objectives

5.2.1. Identifying differences regarding sources and areas of manifestation of stress in people with hypercholesterolemia, and in those with a normal level of cholesterol.

5.2.2. Establishing existing differences between persons with and without hypercholesterolemia regarding some personality traits (neuroticism, anger as a state and trait, feeling of control).

5.2.3. Establishing existing differences between people with and without hypercholesterolemia regarding some psychopathological tendencies (Psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure).

5.2.4. Establishing existing differences between people with and without hypercholesterolemia regarding the coping mechanisms (problem-oriented, emotion-centered, and dysfunctional).

5.2.5. Highlighting existing differences between people with a normal cholesterol level, and those with hypercholesterolemia regarding emotional reactions in danger conditions (fight or flight).

5.2.6. Identifying difference regarding alcohol consumption, smoking, coffee intake, diet (number of meals/day), preference for fat foods, study level, and physical activity in people with hypercholesterolemia.

Hypotheses

5.2.7. There are significant differences regarding the stress level between people with and without hypercholesterolemia.

5.2.8. There are significant differences regarding some personality traits (neuroticism, anger as state and trait, feeling of control) in people with and without hypercholesterolemia.

5.2.9. There are significant differences between some psychopathological tendencies (Psychastenia, depression, immaturity and emotional lability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in people with and without hypercholesterolemia.

5.2.10. There are significant differences regarding the coping mechanisms (problem-oriented, emotion-centered, and dysfunctional) in case of people with and without hypercholesterolemia.

5.2.11. There are significant differences regarding the violent emotional reactions, and the camouflaging or hiding behavior in people with and without hypercholesterolemia.

5.2.12. There are significant differences regarding alcohol consumption, smoking, coffee intake, diet (number of meals/day), preference for fat foods, study levels, and physical activity in people with and without hypercholesterolemia.

5.2. Data on the investigated lots

The research lot was formed from 198 participants, out of which 52,53% received the tests individually at home, and the rest of 47,47% participated to the individual tests face to face.

According to the completed study levels, there are the following percentages: 31,8% have graduate studies, 27,8% have a secondary education, 31% have post-secondary studies, 18% have no secondary education, and 5% have postgraduate studies.

According to the gender difference, 66,67% of the total are women, and the rest of 32,32% are men.

The participants are aged between 20 and 80 years old, with a median of 44,6 years.

According to the height of the participants, it ranges from 1,50 m to 1,90 m, with a median at 1,70 m, and weight ranging from 60 to 120 kg, with a median at 76 kg.

Regarding the cholesterol level, the values range between 100-400 mg/dl, with a median of 219 mg/dl. Out of the participants, 41,92% have a high level of cholesterol, and 58,08% have normal values.

Alcohol consumption is frequent in 2.53% of the participants, in 30.30% it is absent, and in 66,16% it is occasional. 62.63% of the participants do not smoke, 20.20% smoke less than 10 cigarettes/day (moderate consumption), and 15.15% smoke more than 10 cigarettes/day (severe consumption). Regarding the caffeine intake, 83.33% respond affirmatively to this question, and 14.65% deny any intake.

The diet regarding the number of meals per day shows: 5.05% have an irregular, chaotic diet, 3.54% declare 5 meals/day, 9.60% 4 meals/day, 46.97% 3 meals/day, 26.26% 2 meals/day, and 3.03% one meal/day. The preference for fatty foods is affirmed by 14.65% of the participants, the rest of 72.25% of the total deny the intake of fatty foods.

A total of 33.33% of the participants practice sports, while 52.52% show no interest in practicing sports.

According to the medical diagnostics by the time of the examination, the situation is as follows: 11% are diagnosed with HTN, 7.6% with spine problems, 1.5% with diabetes, 1% with CVA, hip sprains, rheumatism, and the rest of 5% with asthma, renal diseases, IBS, fractures, hepatitis, hypoglycemia, hypothyroidism, mitral insufficiency, migraines, neoplasm, osteoporosis, systolic murmur.

5.3 Work instruments

In the present study the following samples have been used:

- Anamnesis; it represents a useful instrument for data collection, which highlights information regarding age, educational level, alcohol consumption, smoking, caffeine intake, practicing sports, and diet.

  For a more precise evaluation of the individual's lifestyle, precise questions have been used, targeting the following: routine physical activity (possibly playing sports), dietary preferences (preference for fatty foods or not, the number of meals/day), in case of smoking the amount of cigarettes/day, in drinkers the frequency of use (the same for coffee drinkers). The level of cholesterol was determined by laboratory investigations. It is considered hypercholesterolemia when the total cholesterol level surpasses 200 mg/dl.

- The COPE coping strategies inventory

  The multidimensional coping strategies inventory was developed by Carver, C. S. Scheier, M. F. Weintraub, J. K. (1989), and it used to assess how people react in stressful conditions. It is comprised of four subscales which evaluate five ways of problem-oriented coping strategies (active coping, coping by planning, repression of competitive activities, refraining from hasty actions, searching for an instrumental social support); five scales which represent ways of emotion-centered coping strategies (searching for emotional social support, positive reinterpretation, acceptance, denial, and turning to religion); four coping strategies which are considered to be of dysfunctional nature (focusing on emotions, venting emotions, behavioral disengagement, mental disengagement). (Carver et al, 1989).

  The internal consistency (α-Cronbach) of the used scales varies from 50 to 94 (excellent) in subscales assessing the response of individuals to stress.

- The ABRAHAM questionnaire assessing the level of stress

  This was conceived by J. Abraham (1985) and it evaluates the global stress intensity according to six factors constituting areas and sources of stress manifestation (ambiance, self-harm, interpersonal relationships, occupation, time management and lifestyle). The questionnaire includes 84 questions with answers: "never,"

"sometimes," "often", "always". The internal consistency (α-Cronbach) of the used scales varied between 73 and 96 (excellent) in the subscales evaluating the stress level based on the six factors.

- The LEVENSON control scale („The Internal, Powerful Other and Chance Scales" – IPC)

  IPC is a self-assessment questionnaire developed by Levenson in 1972 and it evaluates the causal relationship that people establish between achieving a certain finding and their own conduct. It parallels what Rotter in 1966 conceptualized by terms of internal control and external control. The Levenson Scale evaluates three types of expectancies, namely internal control feeling "I", sense of control by others "P", and the feeling of lack of control (intervention opportunities) "S". The internal consistency (α-Cronbach) of the used scales ranges from 52 to 66 (arguably) in the subscales assessing locus of control.

- STAXI – 2 (Spielberger, 1988)

  It is a psychometric instrument for evaluating anger and it is worldwide the most used instrument in anger-management. The test has 57 items, being available for both paper and pencil application, as well as electronically. It is open to adults and adolescents, lasting for about 12-15 minutes. The internal consistency (α-Cronbach) in the used scales varied between 74-94 (excellent) from subscales assessing anger and anger control.

- The EYSENCK personality inventory (EPI)

  The test has been translated into Romanian and adapted within the Institute of Psychology of the Romanian Academy. It was designed by H.J. Eysenck and S.B.G. Eysenck in 1964. It highlights two fundamental dimensions of personality: extroversion – introversion, and stability - emotional instability (neuroticism). The internal consistency (α-Cronbach) of the used scales ranges from 66 to 88 (better) in subscales assessing extroversion\introversion and neuroticism.

- The SZONDI Test

  The SZONDI test is a projective personality test published in 1947, which constitutes an experimental proof for dr. Leopold Szondi's theory regarding the influence of latent recessive genes on our psychological reactions. The purpose of this projective

technique, as of all such techniques, is to give the subject the possibility to express his "inner world" without being aware of it.

- The SP13 questionnaire (cited by M. Ciolac and A.R. Iercoşan/Agora Psyco-Pragmatica N.D.)

  It highlights 13 tendencies, namely: honesty, personal history, psychasthenia, depression, immaturity and emotional instability, schizophrenia, paranoid tendencies, hysteroid trends, psychopathy, mental level, frustration, emotional balance, motivational structure. The questionnaire does not refer to pathological personalities; the quotas over 5 imply the existence of symptomatic answers, meaning that they reveal the existence of tendencies. The internal consistency (α-Cronbach) of the scales used ranged from 41-81 (good) in the subscales evaluating the 13 trends.

6. Clinical and statistical interpretation

6.1. Correlational study

For statistical processing of the data from this research the specialized statistical software SPSS (Statistical Package for the Social Sciences) version 17.0 was used, as well as the r-Pearson correlation coefficient to measure the intensity of the connection between the variables.

A first objective of the correlational study was establishing the association between stress and some personality traits (neuroticism, anger as a state and trait, feeling of control) in people suffering from hypercholesterolemia.

According to the first hypothesis, we expected there to be a significant correlation between stress and these personality traits.

The results indicate that our hypothesis has been confirmed. Indeed, the correlational study emphasizes the highly significant and positive relations between stress (assessed with ABRAHAM) and neuroticism ($p<0.05$). Highly significant and positive relations have also been established between stress and anger as a state and trait, and the subscales ambiance (A), self-harm (SH), interpersonal relationships (IR), time management (TM) correlate highly and positively with the subscale "feeling of lack of control" ($p<0.05$).

Our results converge with those obtained by other authors (Mulller et al, 1995 apud Wilson et al, 2001; Sutin et al, 2010; LeBlanc, 2005), which have remarked the presence of hostility and impulsivity in persons with hypercholesterolemia.

The second objective of the correlational study consists of establishing the association between stress and some psychopathological tendencies (psychastenia, depression, immaturity and emotional instability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in persons with hypercholesterolemia.

In this regard, all the 6 factors constituting areas and sources of stress manifestation (evaluated with ABRAHAM) correlate highly and positively significant with the psychopathological tendencies highlighted by the SP13 questionnaire ($p<0.05$). This confirms our hypothesis, emphasizing that increased stress determines an increase in the psychopathological tendencies in people suffering from hypercholesterolemia.

The third objective of our study aims to establish the association between stress and coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) in persons with hypercholesterolemia. The study confirms the hypothesis that, in case of people suffering from hypercholesterolemia, all the 6 factors constituting areas and sources of stress manifestation (evaluated with ABRAHAM) correlate highly and positively significant with the coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) (assessed with COPE) ($p<0.05$).

The fourth objective aims to establish the connection between some personality traits (neuroticism, anger as a state and trait, feeling of control) and psychopathological tendencies (psychastenia, depression, immaturity and emotional instability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in persons with hypercholesterolemia. Our estimations have been confirmed, the study highlighting significant and highly significant relations between these variables.

The fifth objective of the correlational study has set to establish the association between some personality traits (neuroticism, anger as a state and trait, feeling of control) and coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) in persons with hypercholesterolemia. Our study highlights significant and highly significant correlations between the neuroticism subscale and the repression of competitive activities, searching for emotional social support, turning to religion, focusing on emotions, venting emotions, denial, behavioral disengagement, and mental disengagement subscales.

Also, anger as a trait correlates significant and highly significant with the searching for instrumental social support, searching for emotional social support, focusing on emotions,

venting emotions, and mental disengagement subscales. Regarding anger as a state, it presents significant and highly significant correlations with the focusing on emotions, venting emotions, denial, and disengagement through alcohol consumption subscales.

The feeling of internal control correlates significantly and highly significantly with the positive reintegration, growth, searching for emotional social support, searching for instrumental social support, mental disengagement, refraining from hasty actions, coping through planning, and active coping subscales. The subscale feeling of control through other people presents significant and highly significant relations with the following subscales: mental disengagement, behavioral disengagement, active coping, turning to religion, focusing on emotions, venting emotions, denial, refraining from hasty actions, and searching for emotional social support. Regarding the feeling of lack of control subscale, it has been noticed that there are significant and highly significant relations with the following subscales: mental disengagement, searching for emotional social support, focusing on emotions, venting emotions, denial, and behavioral disengagement.

The study observes correlations between some personality traits (neuroticism, anger as a state and trait, feeling of control) and coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) in persons with hypercholesterolemia, thus confirming our hypothesis.

The sixth objective of the correlational study aims to establish the association between coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) and psychopathological tendencies (psychastenia, depression, immaturity and emotional instability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure) in persons with hypercholesterolemia. The results confirm our hypothesis by highlighting the significant and highly significant correlations between these variables.

The seventh objective is also met, confirming the hypothesis according to which there are significant correlations between the coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional) in people suffering from hypercholesterolemia.

6.2 The comparative study

In order to compare the two lots, we have used the T test (t-Student), the Chi-Square test, and the r-Pearson correlation coefficient.

A first objective of the study is the identification of differences regarding the sources and areas of stress manifestation in people with hypercholesterolemia, and in those with a normal cholesterol level.

According to the hypothesis, we have expected there to be differences between the two lots.

The results indicate that there are significant differences between the two lots (with high values of cholesterol, and with normal values) regarding the intensity of stress; these differences were observed in the following subscales: ambiance (A) ($t=3.173$, $p<0.05$), self-harm (SH) ($t=3.940$, $p<0.05$), interpersonal relationships (IR) ($t=3.181$, $p<0.05$), professional activity (PA) (t-2.354, $p<0.05$).

Another objective of the comparative study consists of establishing the differences between the people with and without hypercholesterolemia, regarding some personality traits (neuroticism, anger as a state and trait, feeling of control). The study assumes that there are differences between the two lots regarding neuroticism, anger as a state and trait, and the feeling of control.

The results confirm our hypothesis, indicating the fact that there are significant differences between the two lots at the neuroticism scale level ($t=2.977$, $p<0.05$), at the anger as a trait subscale level ($t=2.411$, $p<0.05$), and regarding the "control locus" it has been observed at the level of the "feeling of control through other persons" subscale ($t=3.758$, $p<0.05$).

The third objective aims to establish the existing differences between people with and without hypercholesterolemia, regarding some psychopathological tendencies. (psychastenia, depression, immaturity and emotional instability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration, emotional balance, motivational structure). The premise was that there are differences in this aspect.

The results confirm the hypothesis, establishing that there are significant differences regarding the following psychopathological tendencies: psychastenia ($t=3,697$, $p<0,01$), depression ($t=2,812$, $p<0,05$), immaturity and emotional imbalance ($t=3,617$, $p<0,05$), schizoid tendencies ($t=2,641$, $p<0,05$), paranoid tendencies ($t=2,330$, $p<0,05$), hysteroid tendencies ($t=2,559$, $p<0,05$), frustration ($t=2,004$, $p<0,05$), emotional balance ($t=3,371$, $p<0,05$).

The fourth comparative study objective consists of establishing existing differences between people with and without hypercholesterolemia, regarding the coping mechanisms (problem-oriented, emotional-oriented, and dysfunctional).

In this case, also, the hypothesis is confirmed, significant differences being established at the level of the following subscales: focusing on emotions, venting emotions (t=3,752, p<0,01), denial(t=2,617, p<0,05), behavioral disengagement (t=2,827, p<0,05).

The fifth objective tracks the highlighting of existing differences between people with a normal level of cholesterol, and those with hypercholesterolemia, regarding the emotional reactions in case of danger (fight or flight).

Statistically speaking, there are no significant differences between the two lots regarding the e and hy factors, so the hypothesis is not confirmed. Still, according to the graphs (fig 1and 2) there is a difference, in the factors' predominance, in the choices of the people suffering from hypercholesterolemia, these being associated with the existence of a characteristic aggressiveness (e), and of the existence of an emotional reserve (hy). This difference is probably owed to the small number of participants to whom the Szondi test was applied.

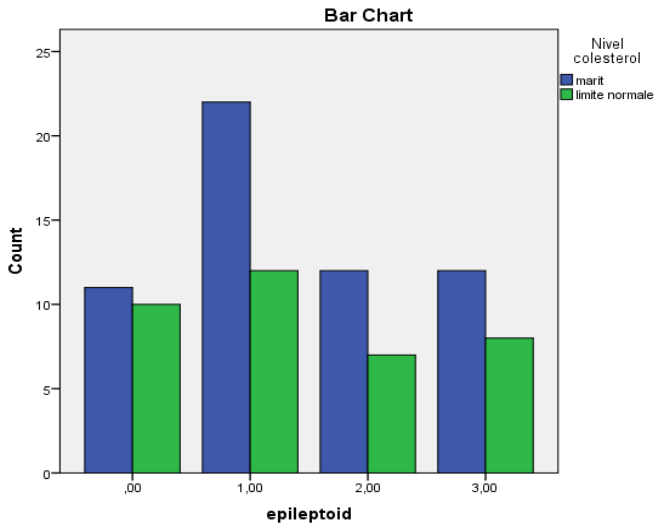

fig. 1

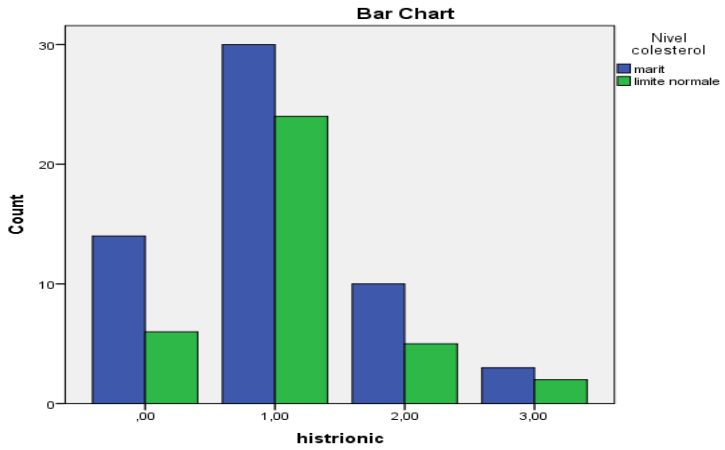

fig. 2

The sixth objective refers to identifying the differences regarding alcohol consumption, smoking, coffee intake, diet (number of meals/day), preference for fatty foods, education level, and practicing sports in people with and without hypercholesterolemia.

There have been no significant differences observed regarding alcohol consumption, so our hypothesis was not confirmed. But, in this case also, the graph highlights a difference in the case of occasional alcohol consumption, in the way that it predominates in those with a normal level of cholesterol. This fact is consistent with the studies showing that moderate alcohol consumption does not modify the total level of cholesterol.

The same results are obtained in the case of caffeine intake, smoking, practicing sports, and preference for fatty foods.

Though, there are some statistically significant differences between the two lots (with and without a normal level of cholesterol), regarding the diet ($p<0.05$), thus our hypothesis is confirmed, being in accordance with some studies carried out in the United Kingdom, according to which those with a higher number of meals/day have a lower level of cholesterol than those eating one or two meals/day.

There a significant differences between the two lots regarding the education level ($p<0.05$), the explanation being that, most likely, access to information provides the prerequisites for a correct diet.

7. Multivariate analysis of constructs at the hypercholesterolemia sample

Given the plurifactorial hypercholesterolemia determinism, our work has attempted to establish certain relationships between variables (personality traits, psychopathological tendencies, coping mechanisms), appreciating how they might influence each other.

To establish relationships between variables, we have used a multivariate analysis type (Path analysis), the used indicators being of two types; indicators of the degree of matching (NFI, RFI, IFI, GFI), which must have values above 0.90, and residual errors (RMSEA), which must be as small as possible. The Path analysis was performed using the AMOS program, version 20.

10 adequate models were obtained, the degree of matching indicators (NFI) and residual error (RMSEA) having scores falling within the threshold values.

In the first model, the overall level of stress, which is associated with neuroticism and anger as a trait, has an indirect effect on the feeling of control through others, causing its emphasis. (fig. 1).

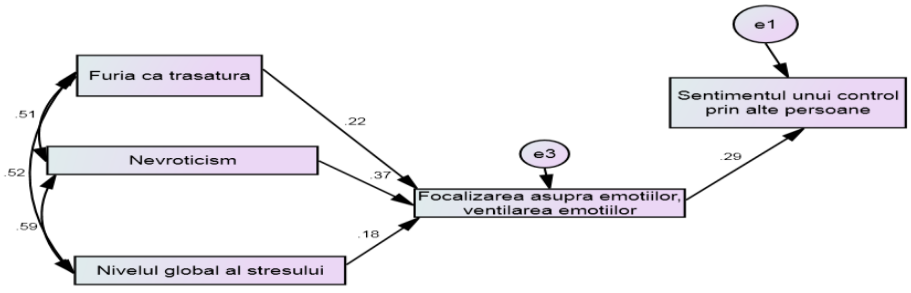

fig. 1

According to the no.2 model, stress reactions, expressed through feelings of personal failure, inability to assert, guilt, and anxiety lead to increased emotional-affective cleavage and to schizoid type thinking in people with hypercholesterolemia. (fig.2).

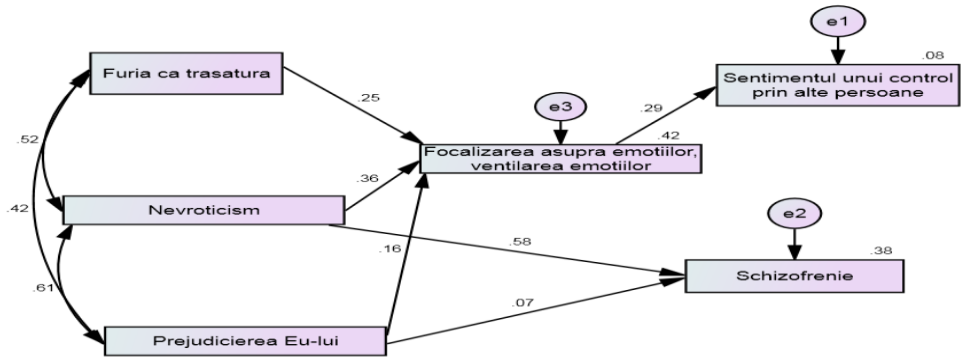

fig. 2

Model no. 3 highlights in people with hypercholesterolemia, that neuroticism and anger as a trait lead to greater paranoid tendencies through direct action, and stress reactions determined by self-harm diminish paranoid tendencies, both direct and indirect, by focusing on emotions and venting them. (fig.3).

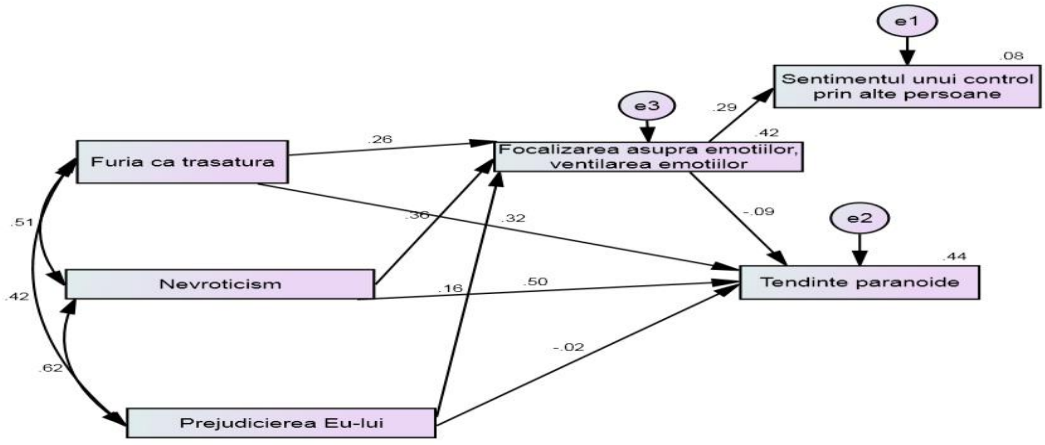

fig. 3

According to model no. 4, stress owed to self-harm in case of hypercholesterolemia, associated with neuroticism, leads to highlighting hysteroid tendencies through direct effect, and neuroticism and anger as a trait lead to diminishing hysteroid tendencies indirectly, by focusing on emotions and venting them. (fig.4).

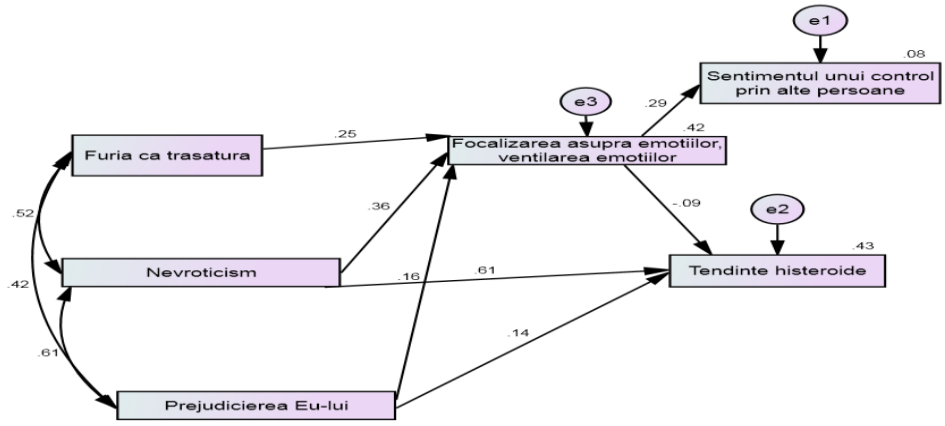

fig. 4

Model no.5 highlights the direct effect of anger as a trait, of diminishing emotional reactions, and of the indirect effect of highlighting them, by focusing on emotions and venting them. (fig.5).

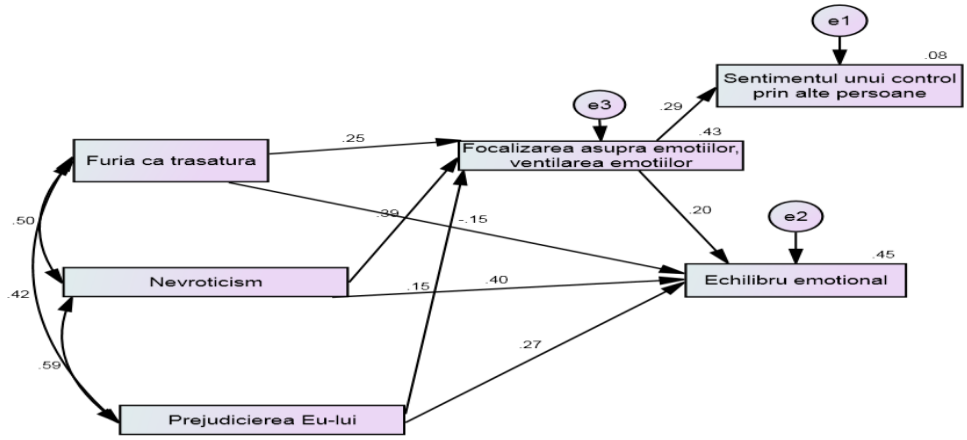

fig. 5

Model no.6 highlights, in the case of people with hypercholesterolemia, increased depressive tendencies, the stress arising from interpersonal relationships and neuroticism, with whom it is associated. (fig.6).

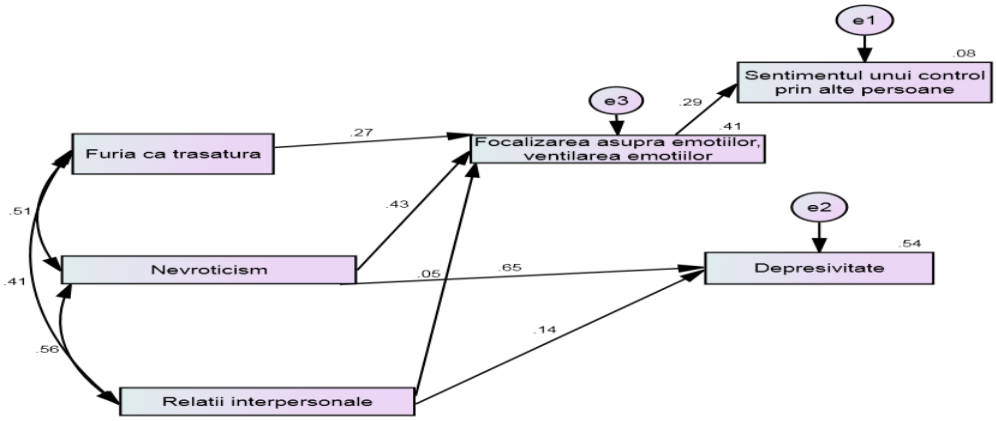

fig. 6

In the case of model no. 7, in people with hypercholesterolemia, increased schizoid tendencies are detected, the stress resulting from interpersonal relationships that associate with neuroticism and anger as a trait. (fig.7).

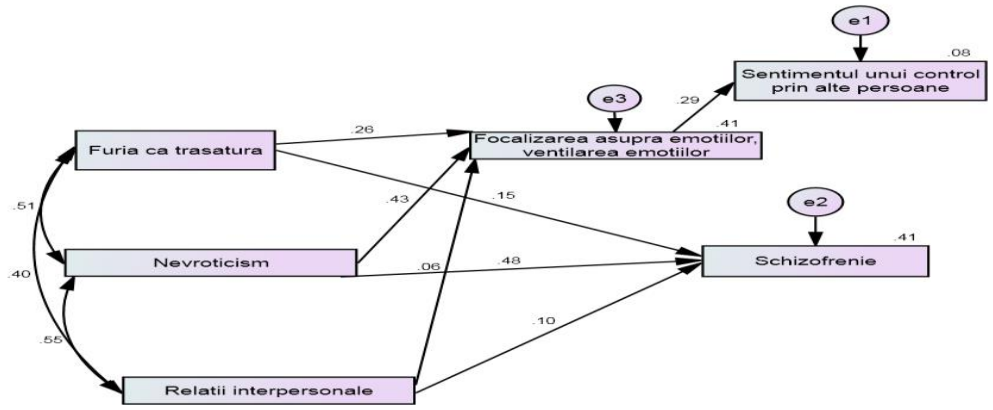

fig. 7

The model no. 8 highlights the emphasis through direct relationship of paranoid tendencies, because of the stress resulting from interpersonal relationships, neuroticism and anger as a trait. Indirectly, the three factors (interpersonal relationships, neuroticism, and anger as a trait), by focusing on emotions, emotions ventilation, determine a decrease in paranoid tendencies. (fig.8).

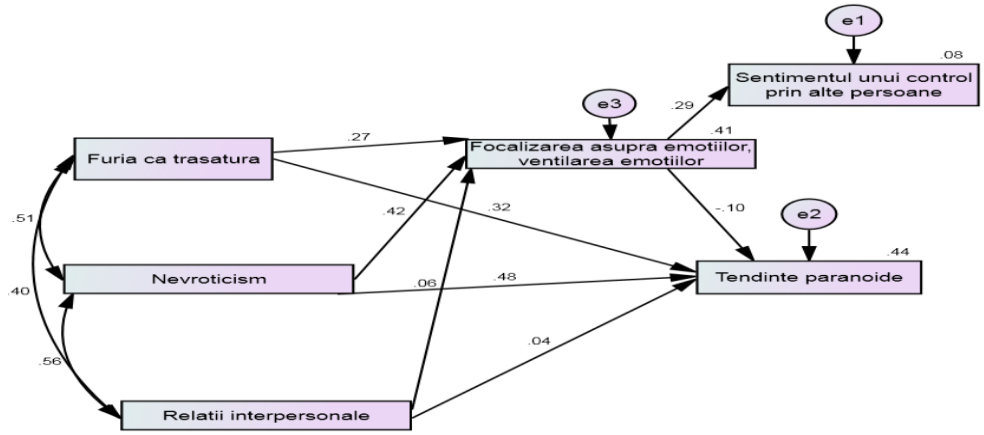

fig. 8

In model no.9, the global level of stress associated with neuroticism and anger as a trait, in case of people with hypercholesterolemia, lead to emphasizing the feeling of control through others indirectly, by focusing on emotions, and venting emotions. (fig.9).

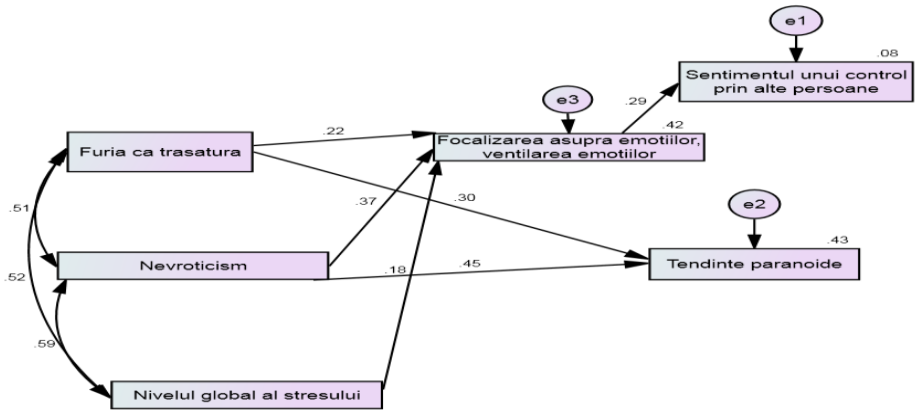

fig. 9

In model no.10, anger as a trait diminishes the emotional reactions through direct and indirect effect, and emphasizes these reactions, by emphasizing mental disengagement. (fig.10).

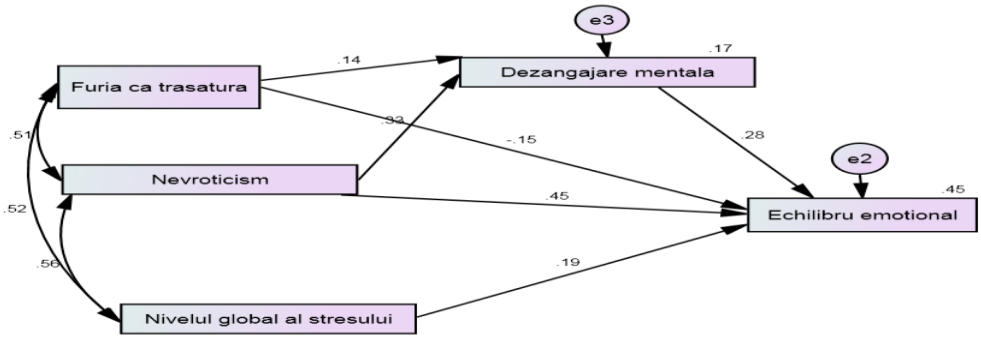

fig. 10

The way in which these variables influence each other, in the case of persons suffering from hypercholesterolemia, probably explains a part of the psychic mechanism of this ailment.

8. Project proposal regarding the efficacy of some psychological techniques in preventing/diminishing the level of cholesterol

Hypercholesterolemia, being a disease with a plurifactorial determinism, in which the psychic factors play an important part, can create the prerequisites of some intervention modalities that target these factors.

In the process of adaptation, stress is a major factor for numerous psychosomatic conditions, including hypercholesterolemia. From this point of view, the stressor itself is not important, but the meaning attributed to it by the subject is. This meaning attributed by the human subject to a certain situation is close connected to some psychological factors, such as personality traits, psychopathological tendencies, coping mechanisms etc.

To achieve such a project a complex, multidisciplinary assessment is necessary. This evaluation aims to detect factors that can generate or maintain high levels of cholesterol. We mention here some conditions that can cause an increase in the total cholesterol level: pancreatic diseases, hypothyroidism, chronic nephritis, renal vein thrombosis, biliary obstruction etc. In addition to these, there are other factors such as nutrition, stress, activity level, family history.

Since stress requires an action both destructive and unbalanced, and one integrative and balanced by virtue of an adaptive effort, the objectives of this approach are aimed at

increasing the adaptability of the individual, acting through specialized techniques on certain traits that ensure good adaptation in overload conditions.

Because stress reactions imply the existence of compensatory responses, and work towards finding behaviors as adaptive as possible, succeeding in adapting depends, among other things, on the information allowing the interpretation of reality. In this regard, psychological training is a practice of conduct strategy that validates and reinforces adaptive reactions under stress. It is a form of mental activity modeling through which optimal strategies for reporting to situations are obtained.

The psychological training includes: modeling techniques of attitudes towards aggressive factors, modeling techniques of mental processes involved in stress response. These techniques and psychological training in general have the following objectives:

- Accommodating the individual to a controlled stress, by the desensitization process. Thus, a high resistance to stress is developed.
- Development of opportunities for forward-looking energy mobilization. In the case of those trained, mobilization is achieved before the onset of the stressful situation.
- Regulating emotional tensions by increasing self-control.
- A good mobilization is insured in extreme situations by creating a positive subjective assembly, which favors the decentering of self, reality orientation, and finding solutions.

Along with the psychological treatment there are other techniques, for example: relaxation and suggestion, autogenic training (Schultz), progressive relaxation techniques (Jacobson), self-observation, introspection etc. all these methods can be applied in order to prevent adaptation disorders, and to increase the resistance to stress conditions.

In this case, the results of this study can be used to identify those psychological factors that constitute disturbing elements in the adaptation process. In this respect it is necessary to apply psychological tests that determine the presence of these factors. Proven useful have been: the ABRAHAM Questionnaire of Stress Level Assessment, the SP13 Personality Questionnaire, the Multidimensional Inventory of Coping Strategies COPE, the LEVENSON Control Scale, the EYSENCK Personality Inventory, the STAXI-2 Psychometric Anger Assessment Tool.

This plan represents a possible instrument useful in the case of patients with hypercholesterolemia, established by a professional team, adequate and adapted, to the extent possible, to the subject's needs. Informing patients represents an integral part of their

assessment, targeting in the end the transformation of the individual towards a better adaptation.

Taking into account the multifactorial determinism of hypercholesterolemia, it is necessary that these patients benefit from a multidisciplinary approach. This targets two types of interventions:

- medical – to obtain balance through medication
- psychological – it is important to know the personality profile in order to establish a specific approach

9. Conclusions

The present paper is part of the concerns regarding the role of psychic factors in the increased level of cholesterol in the blood.

In presenting the theoretical aspects underpinning the study, I have focused on theoretical perspectives that attempt to explain and describe the role of psychological factors in many psychosomatic disorders.

An important conclusion was that, in the majority of diseases, the psychic factor is present, often having a determining role. (Luban-Plozza et al. 1996; Alexander, 2008; Goldbacher et al, 2007; Mihăescu, 1996 etc.).

In this context, hypercholesterolemia falls into the concern of researchers, with many studies demonstrating the connection between stress and a high level of the cholesterol in the blood. It is known that adrenaline and cortisol are hormones that appear mostly during stress, influencing the production of cholesterol. Hostility is an emotion which, in time, raises the adrenaline level, which in its turn increases the cholesterol. Personality traits hostility and impulsiveness are connected to the metabolic syndrome in general. (Sutin et al. 2010). Extraversion correlates positively with the level of cholesterol, and neuroticism presents a negative correlation. (LeBlanc, 2005).

In this study we aimed to identify other psychic factors, besides those already known, in people with hypercholesterolemia, in terms of daily stress. As psychic factors we focused on some personality traits (evaluated with EPI, STAXI-2, LEVENSON), psychopathological tendencies (evaluated with SP13), and some coping mechanisms (assessed with COPE).

Referring to cholesterol, we can affirm that it is one of the major causes of cardiovascular diseases, and in this regard many studies confirm the primary role of plasmatic lipoproteins in

the occurrence of these diseases (for example the Framingham Heart Study shows that an increase of total cholesterol by 40 mg/dl triples the risk of coronary diseases at 5 years).

Considering this information, it becomes relevant to investigate the factors that could play a part in hypercholesterolemia.

Further on, we will present the most important results achieved, the methodological and applicative contribution, and eventual future interest directions that would continue investigating the studied problematic.

A first objective of the comparative study has been investigating the differences regarding the sources and areas of stress manifestation in people with hypercholesterolemia, and in those with a normal level of cholesterol. The formulated hypothesis of this objective relies on data from specialty literature, which shows the presence of the psychic factor in psychosomatic ailments in general, and particularly in hypercholesterolemia, in stress conditions. (Sutin et al, 2010; LeBlanc, 2005; Hillbrand el al, 2000). The results of our study confirm this association, highlighting that the lack of psychological privacy, feelings of personal failure, anxiety, guilt, culpability, inability to refuse additional tasks, and areas regarded as sources manifestation of stress are more intense in people with hypercholesterolemia, compared with those having a normal cholesterol level.

Regarding the second objective of the study, namely highlighting differences between people with and without hypercholesterolemia, in terms of personality traits (neuroticism, anger as a state and trait, locus of control), and the results confirm the observations of other studies that found this. (Savu, 2009; Sutin et al, 2010). It is known that the neurotic personality presents difficulties in adaptation, thus generating stress and predisposition to some diseases.

Other personality traits, like hostility or impulsivity, are connected to the metabolic syndrome in general. (Sutin et al. 2010). In this respect, it has been noticed that subjects with hypercholesterolemia are more prone to perceive situations as annoying, and to often respond to these situations by expressing anger.

Regarding the locus of control, it has been noticed that in case of people with hypercholesterolemia, that by having an external locus of control (feeling of control through other people), they are more stressed, developing diseases with psychological implications easier.

Referring to the third objective of our study, it appears that emphasizing psychopathological tendencies (psychastenia, depression, immaturity and emotional instability, schizoid tendencies, paranoid tendencies, hysteroid tendencies, frustration,

emotional balance) in conditions of stress, in people with hypercholesterolemia, creates emotional imbalance and adaptation issues more pronounced than in the normal cholesterol level subjects.

In the process of adaptation it is possible to trigger affective, cognitive, and behavioral responses, also known as coping mechanisms. From this point of view, numerous studies emphasize the link between stress and coping mechanisms. (Souza et al, 2009; Padden, 2006; Hawk, 2008; Jensen, 2007; McCreary al, 1995).

The fourth objective of our study targets exactly this aspect, namely establishing the existing differences between people with and without hypercholesterolemia, regarding the coping mechanisms (problem-focused, emotional-oriented, and dysfunctional). Focusing on emotions, venting emotions, denial, and behavioral disengagement are adaptation strategies to which the subjects with hypercholesterolemia resort in stress conditions.

Affective reactions in excess constitute a characteristic of the stress state, and adaptation intervenes exactly in preventing or controlling emotional disturbances. (Pearlin and Schoder, cited by Tănăsescu, 2007).

Our results did not identify significant statistical correlations between the two lots (with high cholesterol, and with normal values of it), regarding the e and hy factors. Interpreting the e factor is based upon the hypothesis that it reports to the control and discharge of aggressive energy, and the hy factor indicates the way in which the person controls their emotions. Still, according to the graph, a difference is noticeable both in the e and the hy factors, in people suffering from hypercholesterolemia. The e- constellation is achieved by individuals prone to aggressive outbursts, and the hy- is characteristic for those who either do not want to, or are unable to express their feelings in a perceptible manner.

In terms of differences regarding alcohol consumption, smoking, coffee intake, diet (number of meals/day), preference for fatty foods, level of education and sport, in people with hypercholesterolemia and without hypercholesterolemia, we have achieved results consistent with most studies and literature information regarding this aspect.

There are no significant differences in statistical terms, in terms of alcohol consumption, smoking, caffeine, fatty food preference, and sports. In fact, the studies targeting this show that moderate alcohol consumption is beneficial, influencing the HDL cholesterol level upwards; also, smoking increases the total cholesterol level in the blood by increasing the bad cholesterol (LDL). The effects of smoking are not permanent. The abusive intake of caffeine

influences the levels of bad cholesterol (Kuhn et al. 2014); caffeine in general does not affect the level of cholesterol, as does the intake of fatty foods.

Regarding the education level, there are statistically significant differences between the two groups (with and without a normal level of cholesterol) ($p < 0.05$). This difference is probably explained by access to information that ensures the acquisition of a balanced diet.

Also, there are differences between the two lots (with a normal cholesterol level, and those with a higher level of cholesterol) regarding the diet (number of meals/day) ($p<0.05$). Our results concur with those from studies performed in Great Britain which demonstrate that those with a higher number of meals/day have a lower cholesterol level than those having only one or two meals/day.

9.1 Methodological contributions

The study highlights the contribution of coping mechanisms and other psychological factors, in addition to existing ones, in people with hypercholesterolemia.

Another innovative aspect of the present study lies in the attempt to find, in the multivariate analysis of constructs, a possible way in which psychological factors influence this multifactorial determinism of hypercholesterolemia.

9.2 Contributions in the sphere of practical applications, limitations, and suggestions for future studies

By the fact that it highlights, in the case of hypercholesterolemia, and of other psychological factors besides those highlighted, may be the base for certain prevention programs/interventions for this disorder.

In the limitations of the study it can be said that there is some uncertainty that the questionnaire responses, especially those filled out at home, were given back after a careful reading. There was also a slight reluctance observed, regarding the thematic of the study.

Based on the results of this study, other psychological factors involved in hypercholesterolemia may be highlighted, while future studies could also investigate a sample of subjects with increased LDL.

Selective bibliography

1. Angheluţă, V., Nica-Udangiu, Şt., Nica-Udangiu, L. (1986) – *Psihiatrie preventivă,* Editura Medicală, Bucureşti

2. Athanasiu, A. (1983) –*Elemente de psihologie medicală*, Editura Medicală, Bucureşti

3.Ciolac, M., Iercosan, A. R. (N.D.)–Agora Psycho - Pragmatica, www.uav.ro/jour/index. php/app/article

4. Cosmovici, A. (1996) - *Psihologie generală*, Editura Polirom, Iaşi

5. Cosnier, J. (2007) -*Introducere în psihologia emoțiilor*, Editura Polirom , Bucureşti

6. Dafinoiu, I. (2002) – *Personalitatea. Metode calitative de abordare. Observația şi interviul,* Editura Polirom, Iasi

7. Debra, K. G. (2006) – *Children`s worries and anxiety, experience of life stress and coping responses in the context of social-economic adversity* – ProQuest Dissertations and Theses:2006; ProQuest Central pg.n/a.

8. Degraff, A. H., Schaffer, J. (2008) – *Emotion-Focused Coping: A Primary Defense Against stress for People living with Spinal Cord Injury* – Journal of Rehabilitation 2008, volume 74, no.1, 19-24.

9. Dolto, F. (2005) – *Imaginea inconştientă a corpului*, Editura Trei, Bucureşti

10. Dragomirescu, V. T., Hangan, O., Prelipceanu, D. (1990) – *Expertiza medico-legală psihiatrică,* Editura Medicală, Bucureşti

11. Floru, R. (1974) – *Stresul psihic*, Editura Enciclopedică Română, Bucureşti

12. Goldbacher, E. M. PhD., Mattheus, K. A. (2007) – *Risk is Related to Psychological Characteristics of the Metabolic Syndrome?* – Ann Med. Behave 2007, 34(3) : 240-252

13. Golomb, B. A., Kane, T., Dimsdale, J. E. (1997) – *Severe irritability associated with statin cholesterol – lowering drugs*, QJ Med 2004; 97:229-235 doi: 10,1093/qjmed/hch035

14. Gorgos, C. (1985) – *Vademecum în psihiatrie*, Editura Medicală, Bucureşti

15. Hawk, N. C. (2008) –*Implications of stress and coping mechanisms in the superintendency* – ProQuest LLC; UMI Number : 3371061

16. Hillbrand, M., Waite, B. M., Miller, D. S., Spitz, R. T., Lingswiler, V. M. (2000) – *Serum Cholesterol Concentrations and Mood States in Violent Psychiatric Patients, Journal of Behavioral Medicine, vol.23, no 6, 2000*

17. Horney, K. (2012) – *Psihologia femeii*, Editura Trei, Bucureşti

18. Iamandescu, I. B. (1997) – *Psihologie Medicală*, Editura Infomedica, Bucureşti

19. Ionescu, G. (1975)-*Psihosomatica,* Editura ŞTINŢIFICĂ şi ENCICLOPEDICĂ, Bucureşti

20. Lazarus, R. S. (2011) – *Emoţie şi adaptare*, Editura Trei, Bucureşti

21. Leader, D., Corfield,D. (2012) – *De ce se îmbolnăvesc oamenii*, Editura Trei, Bucureşti

22. Louise, K. L. (2006) – *Relationships among Proactive Coping, Situation-Specific Stress and Coping. And Stress – Related Growth* – ProQuest Dissertations and Theses; 2006; ProQuest Central pgn/a.

23. Luban-Plozza, B., Pöldinger, W., Kröger, F. (1996) – *Boli psihosomatice în practica medicală,* Editura Medicală, Bucureşti

24. Mc Creary, D. R., Sadva, S. W. (1995) – *Mediating the relationship between masculin gender role stress and work satisfaction. The influence of coping strategies.* – Journal of men′s studies, 4.2(nov 30,1995):141

25. Mihăescu, V. (1996) – *Psihoterapie şi psihosomatică*, Editura Polirom, Iaşi

26. Mironţov – Ţuculescu, V., Predescu, V., Oancea, C. (1986) – *Sănătatea mintală în lumea contemporană*, Editura Medicală, Bucureşti

27. Oberritter, H. (1998) – *Colesterolul şi grăsimile în alimente,* Editura Aquila ′93, Oradea

28. Oieriu, S. (1956) – *Manual de chimie biologică(vol.I),* Tipografia Invăţământului, Bucureşti

29. Padden, D. L. (2006) – *The effect of perceived stress, coping behavior, previous deployment separation and defined health promoting behaviors on general well being in female spouses of active duty military during deployment separation* – ProQuest dissertations and theses, 2006; ProQuest central pg. n/a

30. Predescu, V. (1976) – *Psihiatrie*, Editura Medicală, Bucureşti

31. Sîrbu, A. (1979) – *Psihiatrie clinică–Ghid alfabetic*, Editura Dacia, Cluj-Napoca

32. Souza, J. N.–Talarico., Chaves, E. C., Nitrini, R., Caramelli, P. (2009) – *Chronic stress is associated with high cortisol levels and emotional copung mechanisms in amnestic mild cognitive impairement,* Dement geriatr cogn disord 2009; 28:465-470 doi: 10.1159/00259696

33. Stilley, C. S., Sereika, S., Mulldon, M. F., Ryan, C. M., Dunbar-Jacob, J. (2004) – *Psychological and Cognitive Function: Predictors of Adherence With Cholesterol Lowering. Treatment* – Ann Med. Behave 2004, 27(2): 117-124

34. Stoney, C. (1997)– *Stress and personality affect cholesterol*, USA Today Magazine:
Apr 1997, vol.125, Issue 2623, p7, 2p

35. Valeanu, V., Daniel, C. (1977) – *Psihosomatica feminină*, Editura MEDICALĂ, Bucureşti

36. Wilson, D. L., Davidson, K. W., Barksdale, C., Black, B. (2001) – *U-Curved Relation Between Total Fasting Serum Cholesterol and Hostility,* International Journal of Behavioral Medicine 8(4), 282-292