

## Self-determination of the transformation process of the body self-image in the structure of self-awareness of persons with cerebrospinal injuries

### Autodeterminación del proceso de transformación de la autoimagen corporal en la estructura de la autoconciencia de las personas con lesiones cerebroespinales

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## Summary

The research objective is to determine the specific features of the influence of self-determination on the transformation of the body self-image in the self-awareness of people with cerebrospinal injuries. The study involved 2,482 people: 682 subjects (18 to 40 years old) with an injury sustained in a period of up to 2 years; 811 subjects (18-40 years old) with an injury sustained in a period of 2-5 years; 989 subjects (18-40 years old) with an injury sustained in a period of over 5 years. The study of the body self-image was carried out with the proprietary methodology of MSBSI (multidimensional study of the body self-image) and the BIQLI questionnaire by T.F. Cash. The dynamics of the body self-image in individuals within different post-injury periods has been determined. The strong correlations between the features of the body self-image and the development level of a person's self-determination have been revealed. Psychological recovery of persons with cerebrospinal injuries should include programs focused on the development of a person's ability of self-determination.

**Key Words:** ability, communication, cerebrospinal injuries, self-determination, self-image.

## Resumen

El objetivo de la investigación es determinar las características específicas de la influencia de la autodeterminación en la transformación de la autoimagen corporal en la autoconciencia de las personas con lesiones cerebroespinales. El estudio involucró a 2.482 personas: 682 sujetos (de 18 a 40 años) con una lesión sufrida en un período de hasta 2 años; 811 sujetos (18-40 años) con lesión sufrida en un período de 2-5 años; 989 sujetos (18-40 años) con lesión sufrida en un período superior a 5 años. El estudio de la autoimagen corporal se realizó con la metodología propia de MSBSI (estudio multidimensional de la autoimagen corporal) y el cuestionario BIQLI de T.F. Dinero en efectivo. Se ha determinado la dinámica de la autoimagen corporal de los individuos en diferentes períodos posteriores a la lesión. Se han revelado las fuertes correlaciones entre las características de la autoimagen corporal y el nivel de desarrollo de la autodeterminación de una persona. La recuperación psicológica de las personas con lesiones cerebroespinales debe incluir programas centrados en el desarrollo de la capacidad de autodeterminación de una persona.

**Palabras clave:** capacidad, comunicación, lesiones cerebroespinales, autodeterminación, autoimagen.

## Introducción

### *Problem statement*

The relevance of the research problem is determined by both practical and theoretical factors. Practical factors are related to the statistical data on bodily injuries among the Russian population. According to the data published by the Federal State Budgetary Institution "National Medical Research Centre of Traumatology and Orthopedics named after N.N. Priorov" of the Ministry of Health of the Russian Federation, 49 571 993 injuries were recorded in the period from 2013 to 2017, which is 422,6 people per 1000 population of the Russian Federation (Mironov et al., 2019).

The range of issues related to psychological problems caused by musculoskeletal injuries reflects the problem of a person's self-awareness, the transformation of self-conception, caused by a new body self-image. The musculoskeletal injuries affect, first of all, the physical and bodily component of a person's self-awareness, attitude to its own appearance and physical capabilities.

Nowadays, the corporality, physical self-image and appearance are becoming more important in estimating the functional state and the personality dynamics. The body image is considered as a structural component of a person's self-awareness, self-attitude and self-acceptance.

Because of the terminological ambiguity that emerged in modern psychology in connection with the study of a bodily component of self-awareness, the intrinsic and structural-content characteristics of the body self-image have been defined more precisely.

Note that the intrinsic features of the phenomenon under study come from a scientific understanding of a psychological nature of the image.

The analysis results of psychological theories and image concepts testify that in psychology the image has a number of functions (sense-making, regulating, motivating, prognostic, correcting, etc.), which are differently represented in the human conscience. Moreover, the meaning of a particular function of the image can change, resulting in the transformation of the image itself.

Images are the combination of the reflected real object and the previous experience of the subject. Not only the conscious, but also the unconscious, subconscious, super-conscious play an important role in the image creation, i.e. unconscious fantasies or the influence of archetypes, and, on the contrary, a clear and precise consciousness, conditioned by conscious-volitional control, are involved in the image creation, including self-image and body image. In a person's consciousness, the image functions as a mental representative of inner experiences, thoughts, emotions, feelings caused by a certain real-life object.

General conclusions from the theoretical analysis of the problem of body self-image are not so unambiguous. It will suffice to mention that in psychology, everything related to the body is studied by many psychological schools in various ways with the use of different closely-related concepts.

Theoretical analysis revealed that, in spite of the rather high interest in the problem of the bodily component of a person's self-awareness, the modern psychology is characterized by a terminological ambiguity due to the variety of concepts associated with the body self-image: corporeality, described as a universal phenomenon that connects all levels of human existence (Tkhostov, 2002; Yazvinskaya, 2008; Cash, Lafarge, 1996); body schema as a term that defines what notions a person has about the parts and organs of its body, body image (Beskova, Tkhostov, 2004), understood as the internal perception of one's own appearance during interpersonal communication, body concept, defined as formal knowledge of the body, phenomenology of the body, comprehended within the philosophical anthropology (Podoroga, 1995), boundaries of body image, studied in relation to a person's somatic diseases (Poddubnaya, 2017), bodily identity as an awareness of the uniqueness of one's own body (Petrovskaya, 2006), that selects and integrates the attitude to one's own body, appearance, physical self as a perception of one's own physical characteristics (Ulyaeva, 1998), physical self-image (Bonkalo, Goltsov, Shmeleva, 2016; Cherkashin, 2008), body self-image (Frolova, Skugarevsky, 2014; Tsurkin, Razueva, 2014), as well as concepts associated with different perceptions of their intrinsic features (Arina, 1999; Levy, 2004; Sokolova, Dorozhevets, 2010; Morozova et al., 2020).

One of the controversial issues remains the question of the structure of body self-image. While offering different structured constructions, the researchers note the lack of a single conceptual apparatus allowing them to study this phenomenon in its integrity and unity.

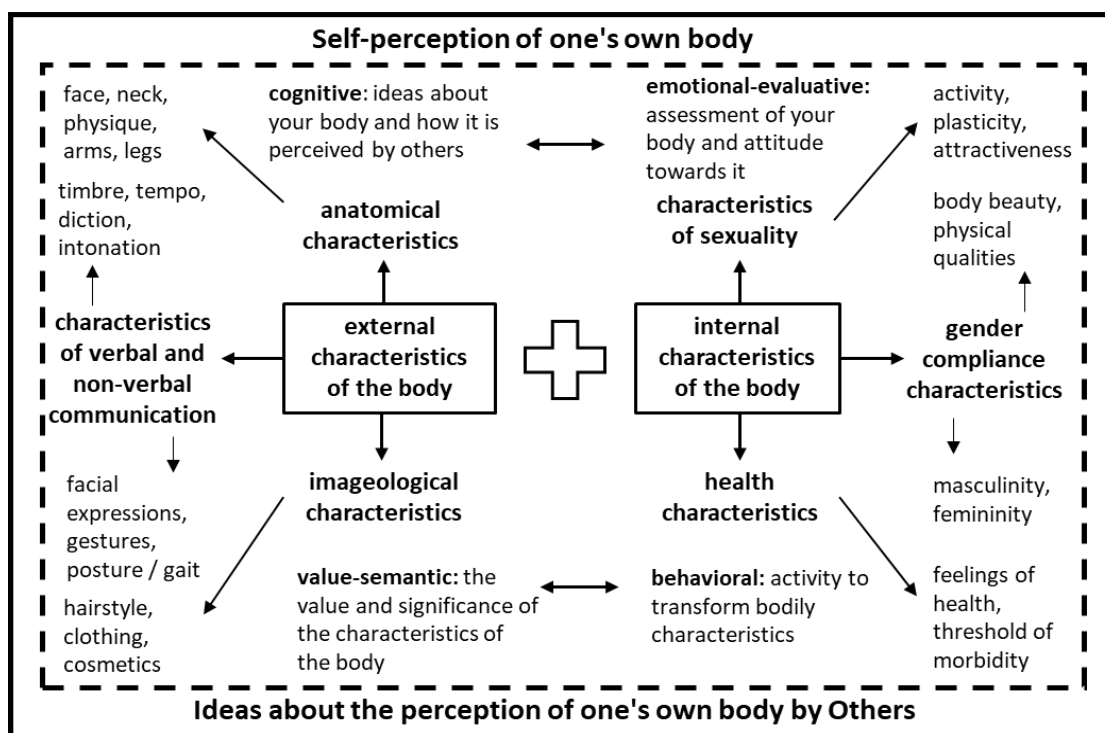
The lack of diagnostic instruments for an adequate assessment of the features of body self-image, and the presence of many methods focused on revealing certain components, complicate the research of psychological nature of this psychological phenomenon in many ways.

### *The essence and structure of the body self-image*

The body self-image is a complex system-and-dynamic structure of a person, reproduced by the subjective reflection of the features of its appearance, structure and state of the body in the process of self-cognition, and the vision of the specifics of their comprehension by others (Maskaeva et al., 2020).

The psychological structure of the body self-image, as a system-based construct, involves 6 main subsystems, each of which has an identical structure and is comprised of the following components: cognitive (ideas and beliefs about one's own body), emotional-evaluative (assessment, as well as attitudes and experiences related thereto), axiological (significance for oneself) and behavioural (a person's activity on the change of its own body) (Novikov, Kutashov, 2016).

The psychological content of the body self-image includes the external and internal characteristics of one's own body. External characteristics include the following features: anatomical (face, neck, constitution, arms, legs), imageological, related to the body modification (clothing, hairstyle, make-up), as well as verbal (speech, voice, timbre, tempo) and non-verbal (kinesics, proxemics, tacesics) communication. The subsystem of internal characteristics, as a totality of internal sensations and feelings in connection with one's own body, integrates the characteristics of sexuality as a totality of responses and experiences related to the sexual desire, somatic health of a person, and the characteristics of compliance of the body and its functions with the gender requirements (Figure 1).



**Figure 1.** Structure of the body self-image.

The system-dynamic approach, as an integration of general psychological methodological approaches/principles and foundations of the synergetic paradigm and the dynamic system theory, makes it possible to investigate and reveal the process-dynamic characteristics of the body self-image as a dynamic system that is transformed in the course of its self-development (Zinchenko, 2005; Shimanovskaya et al., 2020). According to the dynamic system theory, the body self-image is transformed through time, in the course of passing through certain stages and phases of systematic development; according to the synergetic paradigm, this transformation is caused by

overlapping and interaction of spontaneously formed and specially organized conditions and factors.

As a dynamic system, the body self-image is transformed not only due to the natural development of the body, but also depending on the nature of changes in the body caused by factors of different genesis. The actual body self-image is the result of integration of the content of the body self-image in the past, reflecting the subjective experience of body sensations kept in a person's body memory, and the content of the body self-image in the future as a product of a complex combination and interaction of elements of the ideal body self-image (that exists regardless of the characteristics of one's own body), visionary body self-image (that exists in the visionary world of a person) and expected body self-image (that exists in the conscious of a person as a concept of possibilities of development and dynamics) (Bykhovskaya, 2007; Shishkovskaya, 2009; Shmeleva, Logachev, 2019).

According to the outlined statements, a study was conducted, which was aimed at revealing the peculiarities of the influence of self-determination on the transformation of the body self-image in the structure of self-awareness of persons with cerebrospinal injuries.

### **Materials and methods**

To organize the study, the existing and tested diagnostic instruments for measuring the features of the body self-image were analysed. Due to the terminological ambiguity and fragmentation of notions of the content and structure of the phenomenon under study, a proprietary methodology was developed for studying the body self-image of persons with musculoskeletal disorders, in accordance with the developed dynamic concept. After psychometric testing for the content -, construct -, prognostic validity and test-retest reliability, the MSBSI Method (multidimensional study of the body self-image) has six scales correlated with six subsystems of the body self-image, each of which includes four subscales: level of distortion of subjective perceptions (cognitive criterion), adequacy of self-assessment of body characteristics, level of their acceptance (emotional-evaluative criterion), adequacy of aspirations and expectations (axiological criterion) and degree of a person's activity in the transformation of body characteristics (behaviour criterion). The combination of criteria allows for distinguishing a certain type of body self-image: positive (low level of distortion, adequacy of self-assessment, acceptance of peculiarities of the body self-image, adequacy of aspirations and high activity of a person), conflicting (low level of distortion, adequate self-assessment, low level of self-acceptance and low degree of activity), pseudo-positive (inflated self-assessment and high unrealistic level of aspiration along with high activity) and negative (non-acceptance of one's own bodily characteristics, deflated self-assessment and aspiration, low activity).

Thus, the study of the body self-image was carried out using the proprietary methodology (multidimensional study of the body self-image) and the BIQLI questionnaire by T.F. Cash. To reveal the self-determination, we used the University of Rhode Island Change Assessment Scale (URICA), Causality Orientations Scale (Deci, Ryan), Life Aspirations Index (Deci, Ryan), and Zimbardo Time Perspective Inventory Zimbardo, "Style of Behavior Self-Regulation" by V.I. Morosanova.

The study involved 2,482 people: 682 subjects (18 to 40 years old) with an injury sustained in a period of up to 2 years; 811 subjects (18-40 years old) with an injury sustained in a period of 2-5 years; 989 subjects (18-40 years old) with an injury sustained in a period of above 5 years.

The criteria for study enrolment were as follows: age of trial subjects, as well as the severity and period of their spinal cord injuries.

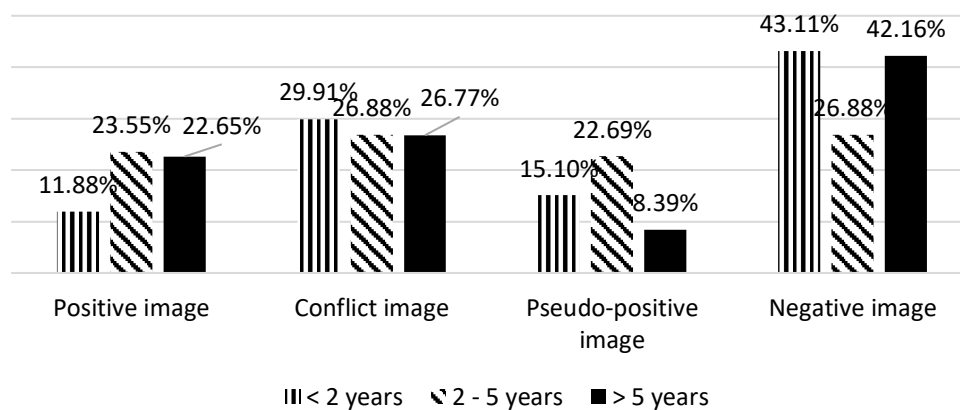
Statistical data processing included the percentage distribution, calculation of arithmetic means, standard deviation, comparative analysis with the use of H-criteria, and Spearman correlation analysis.

## Results

### *Dynamics of the body self-image with cerebrospinal injuries*

At the beginning of the research, the dynamics of the body self-image of persons being in different periods after cerebrospinal injury was revealed (Figure 2).

If only 11% of the subjects, who sustained severe physical injuries two years before the examination, are characterized by a positive body self-image, there are twice as many subjects (22%) in the group with severe physical injuries sustained in a period of above 5 years. The analysis results of the dynamics of the body self-image of persons at different stages of recovery from injury represent a particular interest. Almost a third of the subjects, who are in the recovery period and sustained a cerebrospinal injury in a period of 2-5 years, are characterized by a pseudo-positive body self-image.

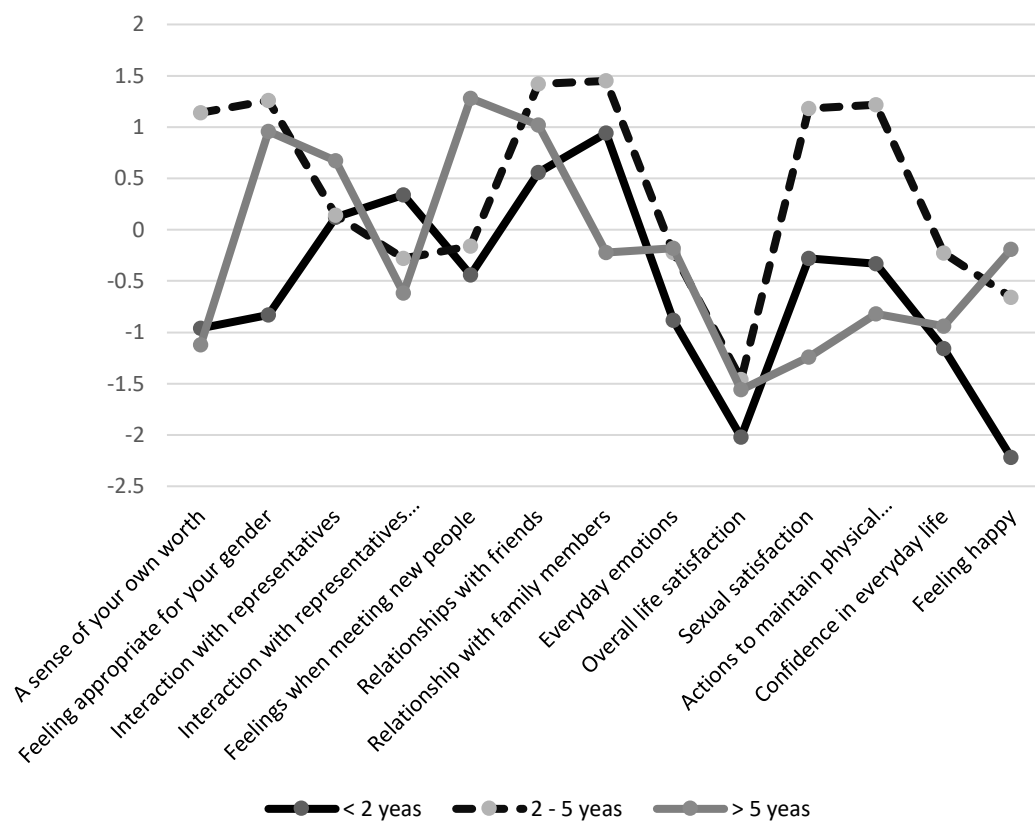


**Figure 2.** Dynamics of the body self-image of persons with cerebrospinal injuries.

Their compensatory fantasies, overestimated aspirations and expectations with regard to the recovery of the former motor functions and physical qualities lay behind the temporary acceptance of their bodily characteristics, the increase of their activity in transformation and modernization. However, the perception of one's own appearance and internal bodily sensations changes over time: five years after the injury, the percentage of subjects with inadequate self-esteem and unsubstantial hopes for the return of the former body self-image reduces dramatically due to the increase in the number of subjects having negative (43%) and conflicting (27%) body self-images.

A qualitative analysis of the cross-sectional research results suggests that transformation of the body self-image of persons with severe bodily injuries, governed by self-organisation laws, does not occur in a linear manner, but through overcoming certain crisis periods related to the perception of their body. However, non-acceptance or distorted perception of one's own body image, low self-esteem of the body's external and internal characteristics are typical for most subjects of all study groups.

On the one hand, it was revealed that the influence of the body self-image of persons with musculoskeletal disorders is quite significant, on the other hand, the perception of such influence is different in groups of people in different post-injury periods (Figure 3).



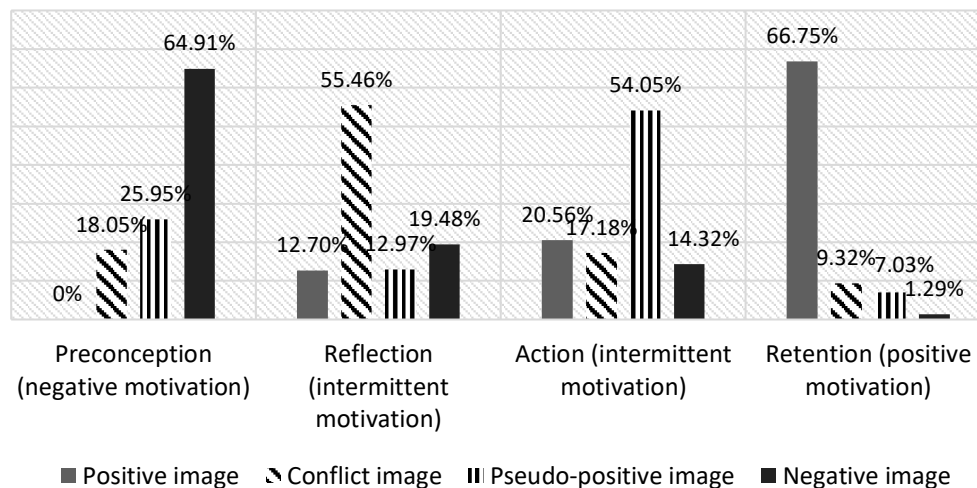
**Figure 3.** Influence of body image on the quality of life of a person with cerebrospinal injuries

The absolute majority of respondents noted that their body image negatively influences many spheres of their lives. It should be noted that the average group estimates of this influence differ in groups of people in different post-injury periods. The most negative attitude to one's own body image was observed in people with post-injury period of up to 2 years at the moment of examination. In this group, a neutral and positive influence was observed in such areas of life as communication with friends and family members.

At the same time, statistical processing of cross-section data suggests that there are significant differences in the influence of the body self-image on the quality of life of subjects in different post-injury periods. Conspicuous is the fact that in the group of people who sustained injuries in the 2-5 years' period, the acceptance of one's own body is significantly higher than in the other two groups ( $p=0,0023$ ). However, this does not apply to all subjects. The analysis of empirical data shows that the body self-image is largely determined by internal factors, rather than just by the post-injury time.

#### *Correlation between the self-determination and the body self-image*

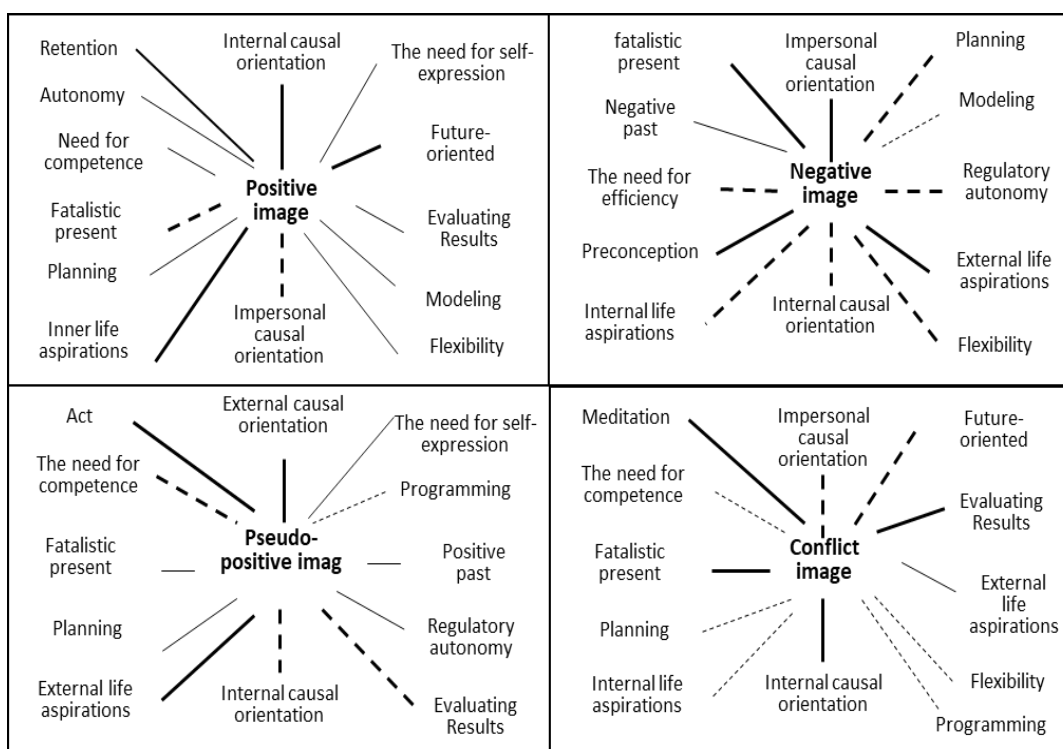
At the beginning of the study, the subjects' motivation for rehabilitation was studied using the URICA questionnaire. A comparative analysis of the percentage distributions of persons with different types of body self-image based on the level of their persistence to the rehabilitation process showed that motivation and body self-image have a fairly close correlation (Figure 4).



**Figure 4.** Percentage of the type of motivation in persons with different types of body self-image

Most of subjects (64,91%), characterized by a negative body self-image, see no point in continuing treatment and participating in rehabilitation. They have no desire for making any changes in their lives, resist the persuasions of their close ones and other people, and agree to treatment only for a short period of time. In the pre-contemplation stage there are 25,92% of the subjects who have a pseudo-positive body self-image and 18,05% - a conflicting image. It is conspicuous to note that among persons with a positive body self-image, no one had a negative motivation for undergoing a comprehensive rehabilitation. On the contrary, the majority of them (66,75%) have a positive motivation. They work on consolidation of certain progress in the rehabilitation and the recovery of lost physical functions. Unstable motivation is mainly typical for people with intermediate types of body self-image.

As follows from the correlation analysis, one of the dominant factors that determine the formation of a positive body self-image is the level of development of self-determination in persons with musculoskeletal disorders (Figure 5).





**Figure 5.** Self-determination of the body self-image of persons with musculoskeletal disorders.

The formation of a positive body self-image is determined by the internal causal orientation of a person ( $r = 0,60566$ ;  $p < 0,001$ ), that suggests the presence of an internal motivation system. The parameters of the positive body self-image positively correlate with the parameters obtained on the following scales: "Autonomy" ( $r = 0,27432$ ;  $p < 0,001$ ), "Need for competence" ( $r = 0,18965$ ;  $p < 0,05$ ), "Planning" ( $r = 0,20232$ ;  $p < 0,01$ ), "Flexibility" ( $r = 0,36322$ ;  $p < 0,001$ ), "Modelling" ( $r = 0,24452$ ;  $p < 0,001$ ), "Need for self-esteem" ( $r = 0,17997$ ;  $p < 0,05$ ) and "Orientation to the future" ( $r = 0,31144$ ;  $p < 0,001$ ).

Orientation to the fatalistic present causes the attenuation of self-regulation processes, inability and unwillingness to resist negative external influences, therefore this orientation leads to the non-acceptance of the body image, low self-assessment of the body and its capabilities ( $r = 0,44167$ ;  $p < 0,001$ ).

## Discussion

The revealed dynamics of the bodily self-image suggests that its transformation does not occur in a linear manner, but through the overcoming of certain crises. We distinguished four main crises in the transformation of the body self-image in the structure of self-awareness of persons with cerebrospinal injuries: crisis of image integrity, crisis of autonomy and acceptance of physical limits, crisis of a new bodily identity and crisis of significance of the renewed body self-image. Let us consider the mechanisms of emergence and overcoming of these crises.

A bodily injury and the associated changes in bodily sensations launch the disintegration as the main mechanism for the emergence of a crisis of integrity. A crisis of integrity is a state when a person cannot realize its own uniqueness, individuality, unity and integrity of its own body. During the crisis of integrity, the body self-image is destroyed, its system becomes extremely unstable due to the loss of significance of its elements that have been essential to the individual and its life activity as a whole. The focus on injury and motor function disorders gradually leads to a hierarchical rearrangement of structural elements of the image, and as a result a physical defect becomes a systemically important factor, through the perception of which other bodily characteristics and sensations are being perceived. The positive transformation of the body self-image in the structure of self-awareness of persons with cerebrospinal injuries, who undergo an integrity crisis, consists in the formation of a transient positive image characterized by self-acceptance of their body as a whole, its positive assessment, enhanced significance of the body's internal and external characteristics not related to motor functions, as well as enhanced activities on their recovery. This image, partially restored on the basis of previous bodily sensations, is quite steady for some time, which determines the stability of a person's self-concept.

The second crisis is the crisis of autonomy. It is another transient phase in the transformation of the body self-image of persons with cerebrospinal injuries. This crisis lies in the person's awareness of partial or complete loss of independence and past physical activity. The mechanisms of emergence and escalation of this crisis are the mechanisms of disorientation and maladaptation, arising from impossibility of functioning of the former image, restored immediately after the injury. The perception and realization that a person does not control or does not fully control its body, come gradually. The crisis of autonomy can be aggravated by the immediate circle who prevents the subject from taking dangerous actions and overprotects it. Despair, uncertainty, helplessness lead to the rejection of one's own body. The crisis comes with extreme dissatisfaction of a person, sense of discomfort, guilt towards the close ones, excessive vulnerability, suffering from helplessness, lack of confidence about the future. At the same time, the study of the boundaries of body capabilities contributes to the formation of a new body self-image as a recovery from the crisis of autonomy. Fundamental changes in the image occur due to the adjustment of life plans, the search for compensatory capabilities of one's own body.

The third crisis - crisis of a new bodily identity - arises due to the confrontation of a person's physical reality with the previous bodily sensations kept in its memory. The realization that the body self becomes different from the body self in the past is the trigger of this crisis. The discrepancy between the body self-images in the past and now, the breakdown in continuity determine the decline in real expectations in the future. The crisis of a renewed bodily identity occurs due to the necessity of developing new life goals and values, revision of lifestyle, personal self-determination, and formation of a new self-concept associated with a new body self-image. The internal conflict between the desire of living up to gender roles and the existing internal prohibitions in connection with the new body self-image is a vivid example of this crisis. Its main contradiction lies between the complexity of accepting a new body experience and the incompleteness of transformation of the body self-image. Here a conflict arises between the personal history of formation of gender and sexual identity and the new features of the body, the conflict between the desired as an image of past experience with real bodily sensations. This conflict determines a decrease, or vice versa, a sharp increase in the significance of external characteristics of the body image. The mechanism for overcoming this crisis involves the development of body capabilities; it is focused not on a body's limitations, but on its capabilities, including new capabilities, rather than restored ones. During the crisis period, the transition is made from chaotic or unrealistic visions of the future to the practical choice of a body's component that will lie at the core of the formation of a new body self-image.

The fourth crisis occurs when the transformed body self-image is evaluated in terms of its social significance. The crisis of significance of a new image is associated with the operation of law of psychological disability. The social community becomes fundamental in overcoming the crisis. The assumption of a new social role determines the acceptance of the changed capabilities of the body.

The intensity and depth of experiencing the crises during transformation of the body self-image are determined by the level of development of the ability to make independent choices. Placed in a difficult situation that resulted in a dramatic change in physical characteristics, a person with an internal causal orientation, experiencing the sense of self-determination and competence, realizes one's own basic and situational needs and therefore makes adequate decisions about its future. Such a person does not take the path of self-consolation and unreal fantasies, but accepts all difficulties of life as an opportunity to preserve the integrity of the self. Having inner life aspirations that increase adaptive capabilities, a person in response to injury mobilizes its internal resources, forms and reconstructs the body self-image, maintaining its connection with the overall acceptance of the self and own peculiarities.

## **Conclusion**

Thus, the self-determination of the body self-image in the structure of self-awareness of persons with musculoskeletal disorders is manifested in a person's ability to act as a subject of its activities: the positive transformation of the body self-image is largely caused by the persons' internal motivation system, its internal causal orientation, the need for self-expression and competence, as well as focus on the future and a high aptitude for self-regulation of one's own behaviour and activities. Therefore, one of the important directions in the psychological rehabilitation of persons with cerebrospinal injuries is the development of their capacity for self-determination, the aspiration for making independent choices of their life path and life philosophy.

**Conflict of interests:** The authors declare that they have no conflicts of interest.

**Authors' contribution:** The authors have participated in the research process, in the writing of the work and in the analysis of the documents.

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