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RESILIENCE IN HEALTH AND ILLNESS

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SUMMARY

Resilience is a relatively new concept that lacks clarity although it is increasingly used in everyday conversation and across various disciplines. The term was first introduced into psychology and psychiatry from technical sciences and afterwards thorough medicine and healthcare. It represents a complex set of various protective and salutogenic factors and process important for understanding health and illness, and treatment and healing processes. It is defined as a protective factor that makes an individual more resilient to adverse events that lead to positive developmental outcomes. Resilience is a positive adaptation after stressful situations and it represents mechanisms of coping and rising above difficult experiences, i.e., the capacity of a person to successfully adapt to change, resist the negative impact of stressors and avoid occurrence of significant dysfunctions. It represents the ability to return to the previous, so-called "normal" or healthy condition after trauma, accident, tragedy, or illness. In other words, resilience refers to the ability to cope with difficult, stressful and traumatic situations while maintaining or restoring normal functioning. The higher the resilience, the lower the vulnerability and risk of illness. Resilient individuals tend to be optimistic, have a tendency to see everything as a useful experience, focus on personal strengths and qualities, use constructive criticism, develop close relationships with others, have developed social skills, and are emotionally conscious. Good resilience aggravates and prevents the onset of disease, provides good heath, facilitates and accelerates healing, and provides productive life and a sense of well-being despite chronic illness. Resilience experts believe that anyone can strengthen their resilience and thus contribute to the advancement of health and, if ill, ease the illness, accelerate and facilitate healing.

Key words: *resilience - health - illness*

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INTRODUCTION

Resilience represents a relatively new concept which is still insufficiently clear despite its increasing utilization in everyday speech and various professions. The term was taken from technical sciences and introduced into psychology and psychiatry. In materials science, resilience is related to the capability of material to revert to its original form after being bent or pressed („the strength or capability of reverting to original form or position after bending, compression or stretching"). Many researchers agree that resilience is a very complex phenomenon which is shifting through time and circumstances, and which can not be regarded as a one-dimensional construct. In psychology, resilience is generally defined as capability of an individual to overcome stress and unhappiness, and to recover. Psychologists dealing with personality psychology usually studied resilience as an individual attribute or characteristic (Thomassen 2018).

The founder of the theory of resilience is a clinical psychologist from the USA, Norman Garmezy, and after him, many people refined and expanded his theory (Zvizdić 2015, Deborah 2001, Luthar 2000). Resilience is not innate, every person possesses resilience and can strengthen it. It consists of seven columns, which are optimism, acceptance, focus on problem solving, defense mechanisms, forgiveness, responsibility, acquaintance and planning future. Resilient persons tend to be optimistic, tend to view everything what is happening to them from the perspective of useful experience, focus on personal advantages and qualities, use constructive criticism, develop close relationships with others, have developed social skills and are aware of their emotions.

The term resilience is very often used in psychologic literature by researchers to describe three different kinds of phenomenon: 1. Positive result despite risk status, ie. existence of risk of negative or poor result; 2. Continuous positive status and functioning despite unfavourable circumstances, that is „confrontation or maintaining competent functioning" in the presence of chronic or major acute life stressors (ie. divorce and similar). Resilience in unfavourable situations implies efficient confrontation which includes efforts to rebuild or maintain internal or external balance under a significant threat through means of human activities such as thoughts and actions; 3. Recovery after trauma, ie. adverse and/or damaging experiences and influences. This third concept of resilience is defined as „successful adaptation despite unhappiness" (Jakšić et al. 2012, Masten et al. 1991). The aim of this paper is to clarify the role of resilience in health and illness.

DEFINITION

Resilience is not easy to define and there is no simple definition since the term covers a very wide range of features, is comprehensive and significant. The name comes from the english word „resilience" which was adopted in Croatian language. The word is translated in many ways, but most often means „the ability to recover". It consists of personal qualities which enable the individual to thrive in the encounter of a problem (Garmezy 1991). Resilience is a complicated interaction of risk factors and protective factors which leads to positive development results (Thomassen 2018). It is a positive adaptation after stressful situations and represents confrontation and heaving above hard experiences, that is, represents the capacity of a person to successfully adapt to changes, to resist the negative influence of stressors and avoid the appearance of significant dysfunctions (war trauma, family issues, workplace issues and similar). This does not mean that there is no awareness of the problem, absence of pain, not putting any effort to avoid the aforementioned. Resilience actually represents the strength to handle and deal with a problem, and to continue normally through life (Zvizdić 2015). Resilience is a constant process of adjustment to newly created conditions which consists of acquiring a growing and broader competence for stress reaction. It is in significant connection with the general developmental processes, relationships with significant others and the specific life circumstances of a person. Resilience development is closely linked to personality development as a whole, and is deeply individual as personality development (Deborah 2001).

In the context of comorbidity, it is important to bear in mind that there are different forms of resilience and that, in accordance with the cascade model, certain factors of resilience may contribute to development of others. It is useful to have in mind personal and group resilience (Fletcher 2013, Jakovljević 2015), physiological, psychological, social and spiritual resilience (Jakovljević 2019), and primary, secondary and tertiary resilience (Hicks 2011). Psychological and spiritual resilience actually represent psychological and spiritual defense mechanisms in crisis states, stress states and trauma. Psychological and spiritual resilience include hope, activity, purpose and meaning, community, gratitude and joy, which overcome vulnerability that includes despair, helplessness, absurdity, isolation, anger and sadness. In other words, resilience on a psychosocial level represents and includes different kinds of psychological, mental, social and spiritual capital. Primary resilience is linked to maintenance of balance, equilibrium and health, which ensure welfare and prevent stress-related diseases. Secondary resilience denotes the factors and processes which enable us to successfully cope with crises and illnesses and to re-restablish health and psychosomatic harmony.

Curing mental disorders is associated with acquisition of life wisdom, development of positive thinking optimism, encouragement of love and gratitude, focusing on future, investing in life and its real meaning. Tertiary resilience represents the ability of some person to live happily, creatively and productively despite the presence of one or more chronic illnesses, that is, a person actively and positively adapts to objective restrictions in older age. From the aforementioned, primary resilience enables good health, physical, psychological, social and spiritual welfare, secondary resilience enables healing and personal recovery, and tertiary resilience enables quality life and a sense of wellbeing despite chronic disease. Appropriate resilience is a prerequisite for successful aging. Every human is a unique and responsible person who strives for self-realization, self-understanding and self-transcendence, its own integrity, self-control and management of its own life. The good news is that resilience can be increased and maintained by learning and training (Jakovljević 2019).

RESILIENCE AND NEUROPSYCHOLOGICAL RESEARCH

Neuropsychological research point to the connection of certain temper and character dimensions, that is, personality traits with the level of dopaminergic (DA), serotonine (5-HT), noradrenaline (NA), but other neurotransmitter activities. DA system is much more active in extroverted persons compared to introverted persons, where positive emotions are connected to additional links of DA in mesolimbic, and possibly in nigrostriatal DA system. The tendency to seek experiences and exploration of something new is also linked to increased DA activity. The tendency to seek something new is linked to interaction of genes DRD4, COMT and 5-HTTLPR, while the dimension of perseverance is linked to interaction of genes DRD4, DRD3 and 5-HT2C (Jakovljević 2018). Connecting comorbidites and multimorbidities on a neurobiological, neuropsychological and patophysiological level could significantly contribute to their more successful prevention and treatment. Optimism as a personality trait plays a very important role in resilience, and is associated with activity of neural circuits of the reward system. Positive emotions, capacity for self-regulation, social competence, social support, close connections to helpers, lower level of denial, avoiding behaviour and retreat, greater flexibility of thinking and open-mindedness, dispositional optimism, are very important components of resilience, that is, the resistance to unfavourable events. Numerous hormons, neurotransmitters and neuropeptides, primarily within the HHA axis, are included in acute psychobiological response to stress. Resilience is associated with fast activation and efficient completion of stress response. Dehydroepiandrosterone (DHEA), which is released in stress, has antiglucocorticoid effect in the brain and has an important role in well-being feeling (Jakovljević 2019).

RESILIENCE AND HEALTH

Resilience represents a complex set of various protective and salutogenic factors and processes which are very important for understanding health and illness, process of treatment and healing, including comorbidities and multimorbidities. The focus here are biologic, psychological, social and spiritual factors and mechanisms which, in every life age, modulate the relation between stress, trauma and/or illness on one side and positive, favourable or desired result on the other side (Jakovljević 2019, Masten 2012, Maddi 2005). Resilience represents the ability to go back to the previous, so-called. normal or healthy condition, after some trauma, accident, tragedy or illness. In other words, resilience denotes the ability to cope with hard, stressful and traumatic situations while maintaining or restoring normal functioning. The higher the resilience, the lower the vulnerability which makes risks of disease and multimorbid conditions lower. According to some, resilience is associated with a force which drives a person to grow through suffering, stress, trauma, disorder or disease. Posttraumatic growth and resilience are two associated, but still different terms. Mental disorders often have the function to encourage the patient to transform his wrong beliefs, to give up his wrong goals and life values and find new and authentic values, to revise his loser story and reveal his authentic life mission through different roles thus shaping his new identity.

Symptoms and neuropsychobiological disfunctions often overlap in mental disorders and many mental and somatic disorders are comorbid, which significantly affects the result of treatment. Beside researching disorder-specific mechanisms, it is of great importance to identify disability-specific mechanisms of abilityto recover. Transdiagnostic research of general and specific ability of recovery could significantly contribute to strengthening the concept of holistic-oriented medicine. Creating a more resilient brain in cancer patients is a huge challenge for the modern basic and clinical sciences (Masten 2012, Jakovljević 2012).

RESILIENCE AND STRESS

A generally known fact is that some people are more sensitive or hypersensitive to unfavourable life events, that is, vulnerable to distress, while other people are more resistant and adaptable. Diathesis, as vulnerability, actually represents a predisposition to some illness or disorder, and includes not just biological factors but also cognitive features, and emotional and interpersonal hypersensitivity. People with expressed predisposition to low stress can react violently and can develop so-called great mental disorder such as depression, and with time, different bodily disorders and illnesses. On the other hand, people without predisposition, that is, resilient people can handle, for most people, difficult psychosomatic stresses, without any damage to mental and somatic health. It should be remembered that even the most resilient personalities can decompensate and develop a mental disorder when distress exceeds their endurance limits and overcomes adaptive capacities. Bad mood, fatigue, low energy level, insomnia, in food consumption or overindulgence, heavy drinking, headaches, various bodily symptoms without organic basis represent different manners of responses in stressful situations. All these disturbances can be associated with fluctuation of neurotransmitter and neurohormone levels in brain, that is, with personality features. According to the so-called permissive hypothesis, a lower serotonine level can mean a predisposition for depression, but also for anxiety disorders and impulse control disorders. People with genetic predisposition or diathesis, after being exposed to pathogenic activity of environment, develop a disease which is activated by a certain pathogen. If some person is very vulnerable and has low resilience, even small life stresses can bring to emergence of harder mental disorders. On the other hand, not even the hardest psychotraumas will cause mental or bodily disorders in resistant people with great resilience. Once mental disorders occur, they may no longer have a clear relationship with environmental stressors, and may in themselves carry the risk of developing somatic diseases and the occurrence of comorbidities. High stress exposure in childhood can lead to enormous changes in brain development and longterm damage. All mental disorders are based on the brain neuroplasticity disorder, and hereditary factors determine vulnerability, that is, propensity for illness. The higher the vulnerability, the greater the chance that the disease will occur, that is, the greater the intensity of the stress, or the less controllability, the greater the chance for the disease to appear. Daily small stressors can accumulate and lead persons with a predisposition for some mental disorder to some difficulties which can result with a disease or disease worsening (Jakovljević 2019).

In the development of post-traumatic stress disorder (PTSD), there is a positive association with negative emotions, on the other hand, PTSD symptoms are negatively correlated with positive emotions (Deborah 2001), which often depends on resilience which is inversely proportional to the onset of PTSD and as such plays an important role in treatment of anxiety disorders, depression and stress reaction (Green et al. 2014, Connell et al. 2013, Zerach et al. 2013).

STRESS REACTIVITY AND RESILIENCE

In a wholesome reaction, an individual confronted with stressors spontaneously diverts bodily and psychological reactivity. Basically, stressors are perceived as

challenge or danger, and acute adaptation to that challenge, that is danger, is established through a stress response pattern. Stressors drive the eustress short and reversible pattern which includes increased activity of one function group and simultaneous reduction of activity of other function group. Both changes increase the total readiness of organism to „flight or fight". Such adaptive reactivity of the organism is meaningful and anticipatory for the needs of the entire organism which is confronted with a stressor (danger, fears etc.). Distressors produce excessive effects which lead into illness, dysregulation, bad state feeling, breakdown and exhaustion (Burn-out syndrome). Acute stress pattern enhances some functions, while delaying others. The pattern of stress diversion is in accordance with Canon's concept of anticipatory preparation for „flight or fight". When the stressor ceases to function, the functional systems spontaneously return to equilibrium relations at rest, and this reversibility is a property of eustress response, which is accompanied by a sense of one's own good state. Eustress is a physiological meaningful transient adjustment, and basically does not disrupt the basic diural rhythms. Unlike eustress, a distressor-induced chronic stress causes stronger and more permanent changes in reactivity, and after cessation of distressor activity there is no spontaneous homeostatic return to operative pattern characteristic of rest (Kovač 2019). In literature, distressor effect is described as allostatic overload, support of prolonged stressful straining through allostasis (Schulkin 2019). Allostatic overload causes exhaustion and fatigue of the system which leads to illness and poor host condition. Allostatic extended straining of the organism is physiologically meaningless reaction which produces adverse effects and blocks circadian rhythm.

Resilience is defined as "a protective factor that makes an individual more resilient (less vulnerable) to adverse events" (Casale 2019). It is also defined as „protective or positive process which reduces maladaptive result in risk conditions" (Hornor 2017). Resilience can phenomenologically be viewed as a certain measure of propensity to move from a eustress pattern to an allostatic response pattern. Resilience is obviously more complex than stress patterns and "superior" to stress regulation, and includes physical and mental (conscious and subconscious) reactivity. The brain is a central integrator in which the physiological patterns of response, including resilience, are qualitatively and quantitatively targeted. In the psychological literature, the formation of patterns of resilience are attributed to the contributions of three groups of mental processes: 1. temperament, intelligence, and cognitive abilities; 2. the quality of past experiences; and 3. the broader environmental factors (neighborhood safety, quality of schools, regulatory activities). Resilience can be seen as the amount of stressor excitement at which exhaustion and negative clinical outcomes occur. Reduced resilience (increased vulnerability) is a condition in which even a smaller amount of stressor excitement causes disruption, and increased resilience (reduced vulnerability) is an increase in that transition relative to the standard level in the population. Resistance decreases with aging. Reduced resilience is clinically evident in post-traumatic stress disorders, severe depression, and suicidal tendencies (Osorio 2017) It is not possible to define unequivocally what contributes to the quantitative differences in individual resilience, but can be increased with different resilience techniques (for example, in sports, military treatment, schooling, etc.). Numerous papers are referring to the various components of neurobiological reactivity involved in the formation of resistance, including: heritable properties, relationships in the neurovegetative system; CRH-ACTH-cortisol axis; gonadotropic, dopaminergic, serotonergic and oxytocin systems; NPY, BDNF and galininpeptidergic systems, DHAE system, etc. Observing and studying individual factors as better resistance status has proven to be useless. At the same time, taking into account a large number of factors collectively gains predictive value. Thus, a panel with high concentrations of NPY, galanin, DHEA and low element levels of the CRH axis correlates with increased resolution (Kovač 2019). The relationships between resilience and epigenetic changes in the brain in animal and human models provide only the outline of possible neurophysiological regulation of resilience. For example, at the receptor (NR3C1) in the hippocampus, the increased expression of the DNMT gene was found in the frontopolar cortex, amygdala and paraventricular nuclei in suicide victims, and this expression was significantly higher than the expression of the same gene in people who died natural deaths suffering from severe depression. Such information on epigenetic processes acts as merely mosaic indicators of processes in the brain that may contribute to patterns of resilience (Poulter 2008).

RESILIENCE AND ILLNESS

Resilience represents a complex set of diverse protective and salutogenic factors and processes which are very important for understanding health and disease, healing and healing processes. These are biological psychological, social and spiritual factors and mechanisms that, at any age, modulate the relationship between stress, trauma and/or illness on the one hand, and a positive, favourable or desirable outcome on the other. Resilience is a positive adaptation and represents the capacity of a person to successfully adapt to change, to resist the negative impact of stressors and to avoid the occurrence of significant dysfunctions and the occurrence of various organic or mental illnesses. It represents the ability to return to the previous, so-called "normal" or healthy condition, after some trauma, accident, tragedy or illness. Good resilience impedes and prevents the onset of illness, provides good health,

physical, psychological, social and spiritual well-being, facilitates and accelerates healing and personal recovery, and provides a quality life and well-being despite chronic illness.

Numerous studies have highlighted the importance of resistance in various diseases. In their work Colon cancer and resilience, Franjić D et al. conclude that individuals with higher levels of resilience are more likely to cope with the disease and that such individuals have a faster recovery and healing process from colon cancer (Franjić et al. 2019). Numerous other studies show that the introduction of interventions aimed at enhancing resilience in oncology facilities is very important to accelerate the recovery process of colon cancer patients. Resilience-enhancing interventions can significantly help patients more readily cope with end-stage colon cancer (Hwang et al. 2018, Solano et al. 2016). Several authors cite the need for different strategies to enhance resilience in patients (Choi et al. 2012, Mosher et al. 2016) in the future for better treatment and faster recovery from cancer, and have conducted a research to examine the impact of a computer system on the monitoring of cancer patients' resilience in colon cancer patients and found that a computer-based system for monitoring the health status of oncological patients had a positive effect on the development and growth of resilience (Kim 2019). Some studies indicate that resilience-enhancing interventions develop a sense of hope in terminal cancer patients (33.34). Many organic and mental disorders are often comorbid, which significantly affects the outcome of treatment. Numerous studies have shown an association between the presence of depression and low resilience (Loprinzi et al. 2011, Somasundaram 2016), as well as the importance and correlation of resistance and cardiovascular disease: hypertension (Colquhoun et al. 2013, Hare et al. 2014), heart failure (Surtees et al. 2003, Crump et al. 2016, Daniels et al. 2012), and ischemic heart disease (Qiu 2019, Robertson 2017).

Resilience plays an important role in the complex process of motivating people to stay mentally healthy and practice behaviors that can help them cope with anxiety and depression as a result of their chronic illnesses, so that they can ultimately improve their own quality of life (Yoo 2006). Therefore, it is of great importance to recognize the mechanisms of the disorder-specific recovery ability and thus significantly contribute to the empowerment of the concept of holistic oriented medicine. Creating a more resilient brain in cancer patients is a huge challenge facing the modern basic and clinical sciences (Masten 2012, Jakovljević 2012), and it is certain that future research will prove to be very important for various other organic and psychiatric diseases. Moral resilience is also important to help people maintain and restore their moral integrity in response to moral distress and in response to moral suffering caused by moral conflicts, doubts, internal and external constraints (Borovečki 2019). Increasing scientific evidence point that, in addition to resistance, adequate exercise (Babić et al. 2018, 2019, Katić et al. 2018) is important for maintaining good health and preventing disease, as well as many other factors.

In medicine, resilience refers to one's capability to recover when having an illness or disease. Resilience may be defined as a collection of protective factors that mediate the relationship between a stressful event, e.g. disease, and positive outcomes. It is an indivisible part of mental health and health in general, well-being and quality of life. Resilience is considered as a dynamic and modifiable process, gradually developed through the life span, by the facing and overcoming of adversary events. Individuals may be resilient in one domain and not in others, or they may be resilient at one spell of time and not at other periods of their lives (Jakovljević 2017). For the purpose of resilience research, the most commonly used so far is the Connor-Davidson scale, which is validated and reliable and has satisfactory psychometric features in relation to the general population, primary health care, general psychiatric patients, and individuals undergoing cancer treatment (Baek 2010).

CONCLUSION

Resilience is defined as "a protective factor that makes an individual more resilient (less vulnerable) to adverse events" and represents a complex interaction of risk factors and protective factors that lead to positive developmental outcomes of the disease. Resilience is a positive adaptation after stressful situations and represents coping and rising above difficult experiences, that is, the capacity of a person to successfully adapt to change, resist the negative impact of stressors and avoid the appearance of significant dysfunctions. Resilience represents the ability to go back to the previous, so-called "normal" or healthy condition, after some trauma, accident, tragedy or illness. In other words, resilience refers to the ability to cope with difficult, stressful and traumatic situations while maintaining or restoring normal functioning while aggravating and preventing the onset of illness, enabling good health, and facilitating and accelerating healing with a quality life and sense of well-being despite chronic illness. The higher the resilience, the lower the vulnerability and the lower the risk of disease. Resilience is not a constant, but it can be strengthened and can contribute to the advancement of health and the relief of disease.

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